CLIMATE ACTION PLAN

ORANGE COUNTY
NORTH CAROLINA

OUTLINE

IMAGE PROVIDED BY ORANGE COUNTY, NC.

VISION

IMAGE PROVIDED BY ORANGE COUNTY, NC.

Together, with our community,
we commit to taking urgent action on the
climate emergency to create and implement
an innovative, equitable, and just transition
to carbon neutrality and climate resiliency.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

MISSION

Our battle against climate change is a moral imperative, an environmental emergency, and an economic opportunity. Orange County is determined to rise to the occasion with a Climate Action Plan that will lead the way toward a low carbon, green-energy, and equitable future that improves community health and well-being, protects our precious natural resources, and creates sustainable economic growth for all Orange County residents.

IMAGE SOURCE: SHUTTERSTOCK

ACKNOWLEDGEMENTS

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IMAGE PROVIDED BY ORANGE COUNTY, NC.

ACKNOWLEDGEMENTS

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Hillsborough/Orange County Chamber of Commerce

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blue strike

PHOTO CREDITS

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LETTER

FROM BOARD OF COUNTY COMMISSIONERS

ACRONYMS

- **CAP** Climate Action Plan

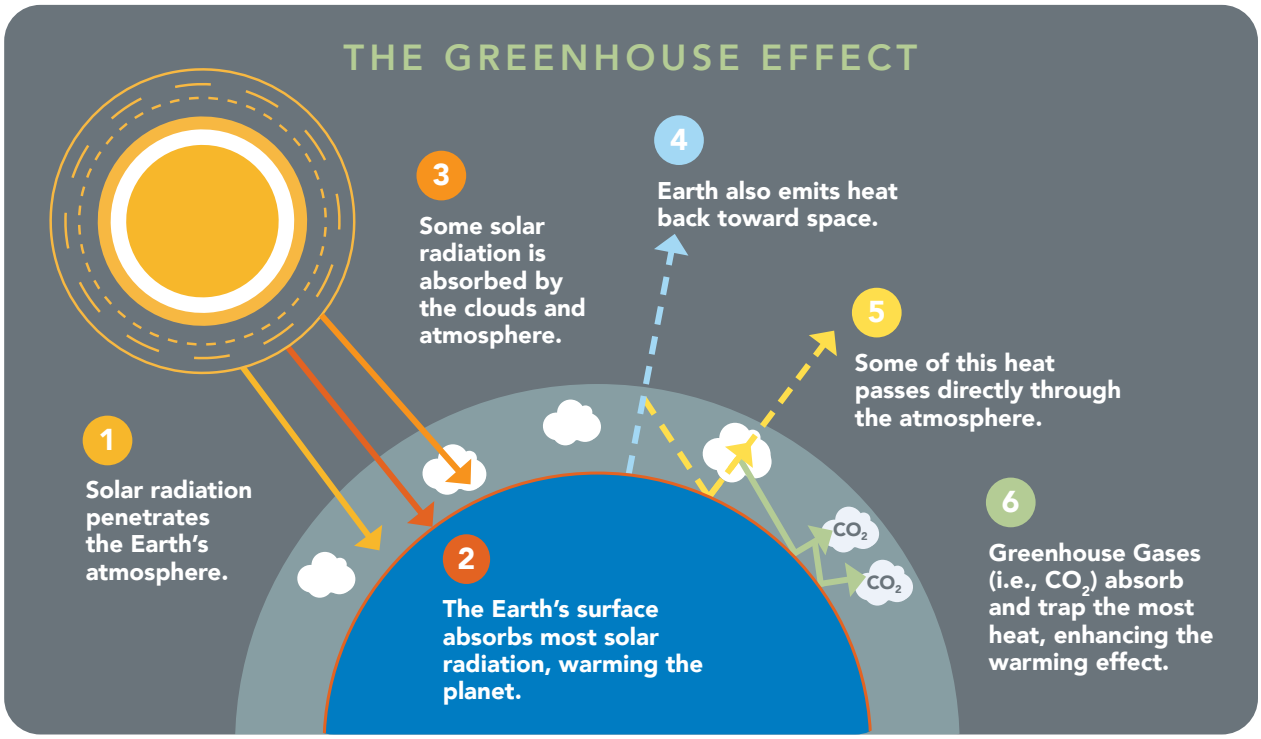
IMAGE PROVIDED BY ORANGE COUNTY, NC.

EXECUTIVE SUMMARY

CALL TO ACTION

Climate change is a pressing global challenge that requires collective action and sustainable solutions to safeguard our planet's future. Greenhouse gas (GHG) emissions which are emitted from the cars we drive, the energy we consume, and the products we buy are having a harmful effect on our environment and are increasing temperatures at an unsustainable pace.

The next few years are critical in limiting global temperature to a 1.5°C increase and mitigating the most severe impacts of climate change. To do so, global emissions need to be halved by 2030, and net zero emissions must be achieved before 2050. According to the most recent report from the Intergovernmental Panel on Climate Change (IPCC), the Earth has warmed 1.09°C since 1850 and many changes such as sea-level rise and glacier and arctic ice melt are now irreversible. Global temperature rise is likely to reach 1.5°C by the mid-2040s which will further stress our environmental systems and, at a local level, will result in more frequent and intense heat waves, floods, drought, wildfire, and air pollution. As a global community, we are rushing to find ways to mitigate the worst of what is to come. As a local community, we are seeking ways to thrive despite the disruptions to our lives and well-being.



CALL TO ACTION *CONTINUED*

Orange County (OC) is already facing periods of severe drought, heat waves, and poor air quality with more and more frequency. While some responses will need to be coordinated regionally, it is important for Orange County to take swift and effective action locally to maintain our quality of life.

In 2022, North Carolina's Governor, Roy Cooper, issued Executive Order (EO) No. 246 committing North Carolina to a clean energy economy and directing next steps in the state's plan to achieve net-zero greenhouse gas emissions and create new economic opportunities for North Carolinians across the state. The EO strengthens North Carolina's commitment to reducing greenhouse gas emissions, increasing the statewide goal to a 50% reduction from 2005 levels by 2030 and achieving net-zero greenhouse gas emissions no later than 2050. EO 246 includes a target specific to the transportation industry which makes up a majority of the state's emissions. It specifies a target of 1.25 million zero-emission vehicles registered at the state level and 50% of all new cars sold as electric by 2030. In line with a climate focus, the state is creating a diverse workforce to help buildout climate change infrastructure and ensure marginalized communities are engaged in the process. This follows a historical trend of previous commitments which have positioned North Carolina as a leader in climate.

Orange County aims to comply with the state and adopt similar climate goals. On June 6, 2017, the Board of Orange County Commissioners passed a resolution to proportionally uphold the Paris Climate Agreement to reduce greenhouse gas emissions between 26 and 28 percent by 2025 from 2005 levels. On September 5, 2017, the Board of Orange County Commissioners adopted a resolution to transition to a 100% renewable energy based economy by 2050. The County also signed the Global Covenant of Mayors in 2018 which is the largest global alliance for city climate leadership. These three commitments have played a foundational role in propelling Orange County to write this inaugural Climate Action Plan (CAP).

The CAP is more than a testament to Orange County's commitment to climate action. It signifies an intentional move to align with wider regional planning processes. In this vein, the CAP echoes the goals and strategies of regional initiatives. This harmonized approach intends not only to create synergies with neighboring localities but also to contribute to a unified regional response to climate change. Details on specific partnerships can be found in the Introduction Section.

EQUITY

The impacts of climate change cannot be separated from the broader social, economic, and political systems that shape our world. Equity refers to fairness and justice in the distribution of resources, opportunities, and benefits. Orange County is committed to integrating an equity lens into all aspects of our climate action efforts, from decision-making to community engagement to the allocation of resources.

On September 2, 2010, the Board of Orange County Commissioners unanimously adopted the social justice goals outlined in the Orange County Social Justice Goals resolution. Climate change impacts individuals differently based on their socio-economic status, race, geographic location, and a host of other factors. Therefore, it is with intention that all the strategies within this CAP have been developed using the equitable lens found in the following resolution.

SOCIAL JUSTICE GOALS RESOLUTION

GOAL:
FOSTER A COMMUNITY CULTURE THAT REJECTS OPPRESSION AND INEQUITY
The fair treatment and meaningful involvement of all people regardless of race or color; religious or philosophical beliefs; sex, gender or sexual orientation; national origin or ethnic background; age; military service; disability; and familial, residential or economic status.

GOAL:
ENSURE ECONOMIC SELF-SUFFICIENCY
The creation and preservation of infrastructure, policies, programs and funding necessary for residents to provide shelter, food, clothing, and medical care for themselves and their dependents.

GOAL:
CREATE A SAFE COMMUNITY
The reduction of risks from vehicle/ traffic accidents, childhood and senior injuries, gang activity, substance abuse and domestic violence.

GOAL:
ESTABLISH SUSTAINABLE AND EQUITABLE LAND-USE AND ENVIRONMENTAL POLICIES
The fair treatment and meaningful involvement of people of all races, cultures, incomes and educational levels with respect to the development and enforcement of environmental laws, regulations, policies, and decisions. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies.

GOAL:
ENABLE FULL CIVIC PARTICIPATION
Ensure that Orange County residents are able to engage government through voting and volunteering by eliminating disparities in participation and barriers to participation.

IMAGES SOURCES: ORANGE COUNTY, NC 2030 PARKS & RECREATION MASTER PLAN.

PURPOSE

Orange County's 2023 CAP is meant to serve as a guiding document towards GHG reductions, both in County operations and community-wide. It is designed as a comprehensive strategy to reduce emissions in a manner consistent with state guidelines and regulations, and to identify cost-effective opportunities to existing and future residents, businesses, and development projects for a more sustainable community. At the same time, the CAP provides a framework for environmental leadership and an educational resource to the community.

The CAP is intentionally a living document that can be revised as needed with clear and transparent metrics by which progress can be both assessed and measured. Although the County will be flexible, it will remain steadfast to the objectives ahead. There are 78 strategies with 164 associated actions outlined within the CAP. Certain commitments within the CAP have risen to the top as the most impactful climate action targets for both community and County operations that should be prioritized above the rest. They are listed as the "Top 10 Things the County Should Do".

The project team analyzed the long term GHG emissions reduction potential of strategies 1–7 and adjusted the percentages (i.e. 50% reduction in GHG emissions by 2030) to ensure that the County could reach net zero by 2050 if they achieve these 7 targets. Please refer to Figure A. Our methodology included running the County's 2019 GHG emissions inventory through the Local Governments for Sustainability's model, ICLEI ClearPath, and then forecast those emissions out to 2050 using escalation factors for projected population growth, national transportation emission requirements, and the utility commitments towards net zero carbon emissions. The ICLEI Clearpath model bases the emission reductions on the unique usage data and emission factors specific to Orange County. The model has the capability of running different emission reduction scenarios based on the percentage of expected emissions reduced.

FOUNDATIONAL: TOP 10 THINGS THE COUNTY SHOULD DO

TARGET	BASELINE
1. Decrease vehicle miles traveled (VMT) 30% from a 2019 baseline by 2050	est. annual reduction of 1.3 million miles using US Community Protocol
2. Increase community EV adoption to 50% by 2035 and 100% by 2050	Currently 12% of all vehicles in Orange County are electric (12% EV adoption)
3. Achieve 50% emission reduction target of all Scope 1 and 2 emissions by 2030 and 100% by 2050 using a 2005 baseline	Scope 1 and 2 emissions have dropped by 40.7% between 2005 and 2019
4. Achieve 100% renewable electricity by 2050 in municipal operation and community-wide	Currently ~13% of all electricity is coming from renewable sources[1]
5. Increase community wide solar capacity by 25% by 2035 to 33.66 MW	Current solar capacity within Orange County is 26.93 MW[2]
6. Complete an electrification study and establish a long-term implementation plan (Phase 1 and Phase 2) for both municipal and community infrastructure by 2025	
7. Expand County funding to include climate expenditures and additional full time sustainability staff	
8. Integrate sustainability as a framework within the overall County's planning process	
9. Identify and prioritize actions targeted to vulnerable populations within the County	
10. Be prepared for climate change	

[1] https://www.duke-energy.com/Home/Products/Renewable-Advantage/Product-Content-Label?jur=NC01#:~:text=For%20comparison%2C%20the%20current%20average,%5BDuke%20Energy%202021%20data%5D.

[2] https://energync.org/maps/

PURPOSE *CONTINUED*

Figure A depicts emissions reduced as a result of all Top 10 commitments. Please see Appendix B for more information on the methodology.

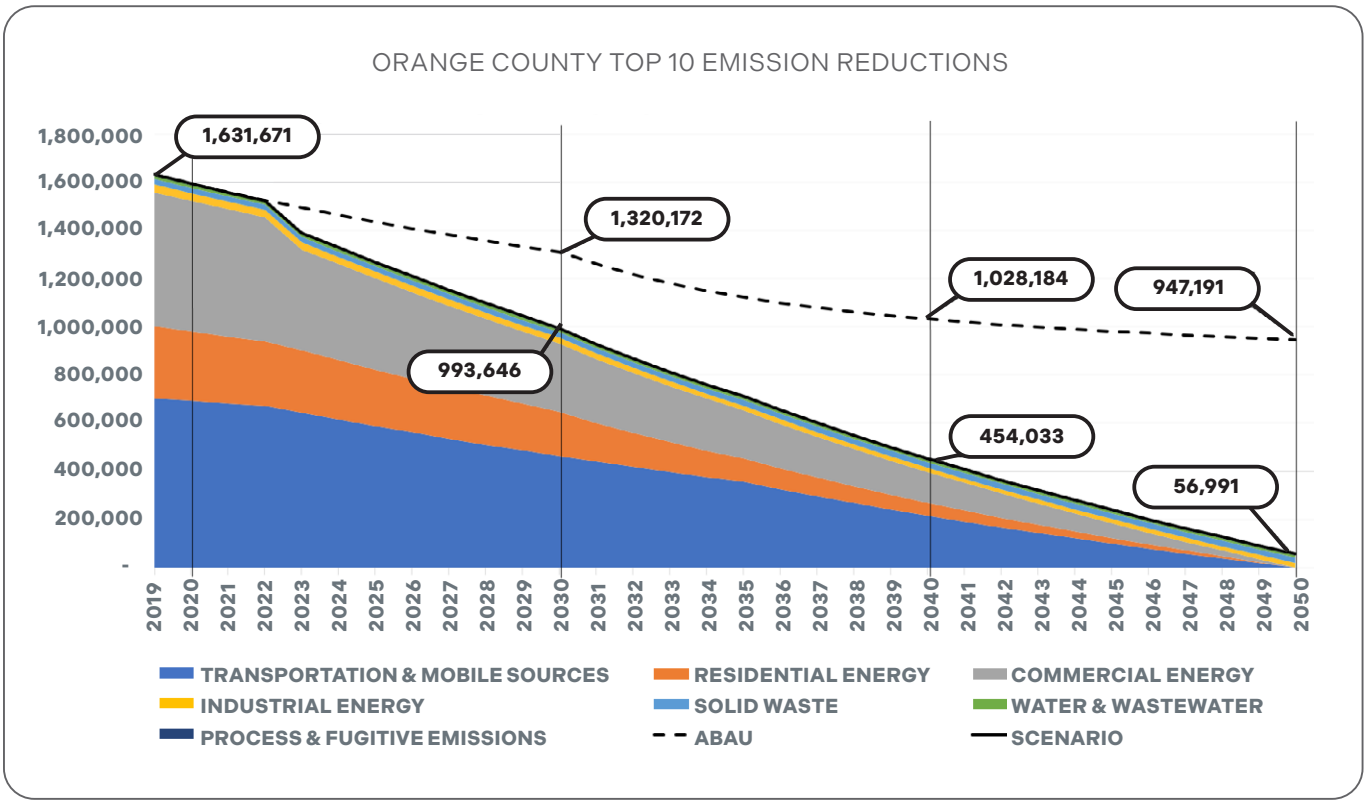


Figure A: Orange County Top 10 Emission Reductions

Strategies 7–10 are not specific to GHG emission reduction. Instead, these strategies serve as guiding frameworks for consideration. Expanded funding should be allocated to projects identified in the CAP and special attention should be paid to additional staffing needs that might be necessary. In addition, all planning decisions should continue to weigh factors of environmental impacts against the social and economic impacts that these projects will present. Finally, all planning processes should adhere to the County maintaining course to provide equitable solutions and to be prepared for climate change.

In addition to the Top 10, goals, strategies, and actions are further developed throughout the CAP in the following sectors: Transportation, Built Environment and Energy, Resource Conservation, Green Community and Resilient Community. These sectors clearly map a qualitative and quantitative approach to actionable solutions that the County can take.

STAKEHOLDER ENGAGEMENT

Community engagement was a critical component of Orange County's CAP planning process. Community members are the ones that experience the effects of its plan, projects and policies. In the process of creating the CAP, Orange County worked (and will continue to collaborate) with existing universities, organizations, small businesses, and public and private stakeholders in and around Orange County. Orange County's stakeholder engagement events have included survey reports, focus group discussions, workshops, and participation in the annual Orange County Agricultural Summit. Participants' comments and suggestions have been integrated into the CAP to the best of the project team's abilities. As this CAP is implemented, collaboration between the County and these stakeholders will remain essential because they are, as members of the community, best equipped to inform the CAP team of challenges the community faces.

Ag Summit community engagement session, February 2023.

COST & IMPLEMENTATION TIMELINE

Efficiently allocating resources and funds is a cornerstone of the CAP for Orange County. Structured by year and specific focus area, the budget section presents a clear trajectory of expenditures and investments to facilitate the County's vision of a sustainable future. An overview of the funding plan is provided in the core body of the CAP, providing a breakdown of the estimated costs associated with each core goal. The implementation year for each strategy was selected based on its priority score and alignment with the top 10 things the County could do. Strategies set for immediate rollout have a higher priority score, whereas those with a later implementation year indicate a lower priority score. To further clarify our financial commitments and implementation timeline, the appendices serve as a detailed resource. Within them, there is a table delineating possible internal funding mechanisms, a table detailing potential funding sources from federal, state, regional, and local levels, a comprehensive funding plan that itemizes each strategy's estimated cost, the proposed implementation year, and possible funding source(s) and a detailed implementation plan specifies each strategy's projected rollout timeline, primary implementation lead(s) and potential partners. More details on funding and implementation schedule can be found in Appendices D - G.

CONCLUSION

While the proposed CAP actions can be daunting, the cost of inaction is much higher. Investments now will substantially reduce long-term operation costs, reduce recovery costs from climate-related disasters, and promote growth in local jobs and the economy. The goals are ambitious, but ones that we believe we can achieve. There will undoubtedly be twists and turns on this path, and we will need to stay flexible and adapt along the way. But if we can achieve these goals, we believe that we can build a community that is healthy, connected, and vibrant. We encourage everyone to embrace and fully participate in implementing this CAP.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

INTRODUCTION

BACKGROUND

Nestled in the hills of the North Carolina Piedmont, Orange County is located between the Research Triangle Park and the Triad cities of Greensboro, Winston-Salem and High Point. There are an estimated 153,166 residents with a growth rate of 0.9% in the past year according to the most recent United States census data. Orange County includes historic Hillsborough, the county seat; Chapel Hill, home of the University of North Carolina; and Carrboro and Mebane, former railroad and mill towns. The County encompasses 400 square miles of rolling farms and forest, vital urban centers and small towns. Orange County combines the best of cosmopolitan and rural values with an abundance of historical, social and cultural resources.

Recognizing the need for urgent and ambitious climate action based on public concern and scientific evidence, Orange County saw the imperative to systematize and accelerate efforts. This 2023 CAP represents the next step, unifying existing climate work under one strategic umbrella to equitably transition Orange County to a low-carbon, climate-resilient community.

In response to the need for a formal CAP, a Climate Action Team sub committee assembled to lead the planning process. This sub committee has representatives from 17 county-wide departments including Asset Management Services, the Budget office, Emergency Services and the Health department to name a few. The group is led by a full time Sustainability Manager who keeps the County's Board of Commissioners updated on progress.

APPROACH

Climate actions are not isolated events. They require collaboration and cross-cutting strategies across multi-jurisdictions, public agencies, nonprofits, commercial businesses and residential communities. This CAP emerged as a result of an extensive review of both environmental state mandates, the commitments of local and regional jurisdictions, and existing public private partnership structures. The County leveraged existing planning commitments where feasible and integrated new strategy elements to tailor this plan uniquely to the County.

Orange County has committed to working with state, regional and local partners to maximize our impact through collective planning and implementation of climate initiatives. Some of the ways the County engages are:

- **STATE PLANNING**
- **REGIONAL PLANNING**
- **LOCAL PLANNING**

STATE PLANNING

North Carolina Clean Energy Plan sets a net zero GHG emissions target by 2050 and has established goals to support this target by fostering long-term energy affordability and accelerating clean energy innovation, development, and deployment to better serve business and residential communities. To support these goals, the plan states a commitment to develop carbon reduction policies and the tools needed to support these policies as well as to modernize the grid to support clean energy resource adoption.

The Cities Initiative, led by the Environmental Defense Fund, is a collaborative effort among North Carolina local governments to address GHG emission reductions to evaluate barriers, business needs, and partnership opportunities. During Phase 1, the Initiative identified 12 core goals around clean energy, transportation, and the built environment that the collaborative will focus on in the coming months. A large part of the analysis process is to uncover funding approaches to support these areas. Phase 2 will unfold in 2024. During this phase, specific strategies and actions will be determined to lay out a roadmap for implementation.

REGIONAL PLANNING

Triangle Clean Cities Coalition leverages resources from the Department of Energy's Vehicle Technology office to promote alternative fuels and electric vehicle adoption. The coalition provides collaboration, multi-jurisdiction grant opportunities, workshop education and technical assistance to municipalities who are committed to finding sustainable transportation solutions.

Orange County, the **University of North Carolina (UNC) at Chapel Hill**, and the towns of **Carrboro**, **Chapel Hill**, and **Hillsborough** are coordinating on a climate action initiative to identify areas within the County that are well suited for new public electric vehicle charging stations.

The Triangle Climate Resilience Partnership is a cooperative partnership among the Town of Cary, the Town of Chapel Hill, the City of Durham, the City of Raleigh, Durham County, and Orange County. The Steering Committee is composed of the partners' Sustainability Managers, Sustainability Directors, and Resilience Officers. This partnership—in partnership with UNC Asheville's National Environmental Modeling and Analysis Center and the Central Pines Regional Council—performed a quantified assessment to help regional decision makers understand which assets are most vulnerable to specific threats and provide guidance on potential solutions.

REGIONAL PLANNING *CONTINUED*

Triangle Sustainability Partnership has successfully initiated the "Solarize the Triangle" program which, in the first year of the partnership (2022), hit its top goal of reaching Tier 8 pricing, lowering the cost of solar for all participants by thirty-seven cents per kilowatt (kW), achieving $300,500 in annual utility bill savings, generating $5.98 million in new clean energy development, creating 1,731 kW of new clean energy capacity, and avoiding 3.5 million pounds of carbon dioxide annually. This is a crowd source funding campaign that bundles solar projects together to attract wholesale pricing from developers. This program will be expanded in 2024 to focus on electrification with a new program entitled "Electrify the Triangle".

Central Pines Regional Council (formerly Triangle J Council of Governments) is a resource and support hub for local governments, community members, and partners across Chatham, Durham, Johnston, Lee, Moore, Orange, and Wake counties. This public private partnership focuses on building networks to address gaps, barriers, and funding opportunities in five key areas, including Environment & Resilience and Mobility & Transportation.

The **Southeast Sustainability Directors Network** is another consortium that Orange County is involved with to help facilitate and advocate for regional climate initiatives. This network offers peer learning opportunities, equity resources, and information on regional funding.

LOCAL PLANNING

A number of agencies work together to provide public transportation in Orange County. Orange County Public Transportation, GoTriangle, Durham-Chapel Hill Metropolitan Planning Organization, Chapel Hill Transit, UNC and the towns of Chapel Hill, Carrboro and Hillsborough are all partners in planning transit and developing the **Orange County Transit Plan**. In November 2012, Orange County voters approved a transit-dedicated half-cent sales tax investment to expand and better connect the public transit network in Orange County and throughout the Triangle region.

The **Orange County 2030 Comprehensive Plan** serves as a "blueprint" document to guide future policy decisions for the County through the year 2030. Chapter One indicates a formal commitment to sustainability which has laid the foundation for this CAP planning process. The County is currently updating the 2030 Comprehensive Plan and will take into consideration the goals and strategies outlined in this document and integrate the two planning documents as much as possible.

The **2023 Orange County Five-Year Strategic Plan** is underway which will lay out priorities to guide policies and budget decisions from 2024 through 2028. The plan will have underpinning themes of sustainability and equity and will prioritize actions that support and defend vulnerable populations.

LOCAL PLANNING *CONTINUED*

Parks and Recreation Master Plan offers a robust overview of park facilities and services. The plan's intent is to examine the lessons and experiences of the past, identify current issues and challenges, and project community needs and desires into a vision for the future – a future that ensures a legacy of parks and public open spaces for current and future generations.

In addition to the agency collaborations underway, the County has taken into account the alignment of regional commitments. Following state guidance, the County will work with its neighboring cities and university to share funding resources and best practices and maintain a dedicated focus to work collectively to ensure that these commitments stay on course. Table A portrays a snapshot of current state and regional commitments.

COMPARISON: CURRENT STATE AND REGIONAL COMMITMENTS AGAINST COUNTY NEW TARGETS

SECTOR	ORANGE COUNTY	STATE	CHAPEL HILL	CARRBORO
EV ADOPTION	Increase community EV adoption to 50% by 2035 and 100% by 2050	EO 246: Establishing targets of 1.25 million zero-emission vehicles registered and 50% of sales by 2030	Create a town-wide electric vehicle charging station network	Emissions reduction challenge to reduce communitywide transportation emissions by 50% by 2025
VMT	Decrease vehicle miles traveled (VMT) 30% from a 2019 baseline by 2050	EO 246. The order requires NC DOT to develop actionable strategies for Vehicle Miles Traveled (VMT)	Create walkable, bikeable, transit-served neighborhoods, Increase walking, biking and transit use (mode-shift)	Reduce Greenhouse Gas Emissions from Motor Vehicle Use by 80% by 2030
EMISSION TARGETS	Achieve 50% emission reduction target by 2030 and 100% by 2050 using a 2005 baseline	EO 246. Reduce statewide GHG emissions to at least 50% below 2005 levels by 2030 and achieve net zero emissions by 2050	Halfway to net zero by 2030: 15% of commercial, 30% of residential, 100% of Town buildings	The 2014 plan set a goal of a reduction in emissions from municipal operations on the order of 5-10% within a 2 year time frame
RENEWABLE ENERGY	Achieve 100% clean renewable energy by 2050 in municipal and community sectors	HB 951. Reduce electric power sector greenhouse gas emissions by 70% below 2005 levels by 2030	80% clean renewable energy by 2030; 100% by 2050	Projects on Town buildings, including solar leasing; dedicate adequate funding to these projects
	Increase the % of community wide solar by 25% by 2035	There are 31 community solar projects that operate in 93 of 100 counties in North Carolina providing electricity to 25% of North Carolina residents	Green the Grid; Participating in Solarize the Triangle	Pursue Community Solar Projects; Participate in Solarize the Triangle
ELECTRIFICATION	Complete an electrification study and establish a long-term implementation plan (Phase 1 and Phase 2) for both municipal and community infrastructure by 2025	All-electric new construction standards; All newly sold appliances are high-efficiency models	Net-zero emissions for new construction; Energy audit requirement at time of sale	Facilitate Low Cost Financing for Energy Efficiency and Renewable Energy Projects

Table A: Current State and Regional Commitments

LOCAL PLANNING *CONTINUED*

COMPARISON: CURRENT STATE AND REGIONAL COMMITMENTS AGAINST COUNTY NEW TARGETS *CONTINUED*

SECTOR	HILLSBOROUGH	UNC	DURHAM COUNTY	CHATHAM
EV ADOPTION	Develop and adopt electric vehicle requirements for developments; Offer incentives for electric vehicle charging infrastructure in developments	Increase fuel efficiency of campus fleet based on CAFÉ standards	Encourage the use of plug-in electric vehicles in Durham as a substitute for petroleum powered vehicles to help achieve community-wide air quality and greenhouse gas emissions reduction goals	Encourage private vehicle owners to use electric vehicles; develop charging stations for electric vehicles and encourage apartment owners and homeowners to install charging stations
VMT	The Comprehensive Sustainability Plan identifies ways Hillsborough can convert vehicle trips into walking, biking, or transit trips.	Expand Vehicle telematics; Establish a Commuter Alternative Program	Increase use of environmentally preferred transportation options	Expanded public transit is a stated goal of the CAP
EMISSION TARGETS	Commitment to reducing emissions to net zero in the electricity sector	The 2014 plan set a goal of a reduction in emissions from municipal operations on the order of 5-10% within a 2 year time frame	Commitment to reducing emissions to net zero in the electricity sector	Focus on energy efficiency and community EV adoption
RENEWABLE ENERGY	80% renewable energy by 2030; 100% by 2050	Commit to onsite solar and RECs	80% renewable energy by 2030; 100% by 2050	100% clean energy by 2050; Install rooftop solar panels where feasible
	Participating in Solarize the Triangle	Commit to onsite solar and RECs;	Participating in Solarize the Triangle	Identify potential sites or areas for the location of renewable energy facilities, including solar farms and wind plantations
ELECTRIFICATION	Investigate opportunities and incorporate sustainability and climate initiatives in facility development including geothermal, solar, weatherization, and green infrastructure	Continue Building Optimization Program; Continue Energy Conservation Measures Program	Reducing total energy use is a key tenant of Durham County's ability to reach its renewable energy goals.	Encourage energy audits for private and public buildings with incentives for follow-up retrofits on existing buildings

Table A: Current State and Regional Commitments (*continued from page 20)*

OUR PROGRESS

In 2008, sustainability was threaded throughout Orange County's 2030 Comprehensive Plan. The integration and collective impact of environmental, social and economic elements was recognized as a contributing factor to ensuring a healthy and vibrant community. Since then, Orange County has demonstrated a long-term commitment to pursuing initiatives that support this vision, as listed in the following sectors.

OUR PROGRESS *CONTINUED*

BUILT ENVIRONMENT AND ENERGY

- ☑ Set a goal of using 100% renewable energy by 2050
- ☑ Set goal of a 3% yearly reduction in energy use in County operations
- ☑ Efficient lighting and HVAC (heating, ventilation & air conditioning) policies in place
- ☑ On-site solar on several County buildings, with more under way
- ☑ 5 County buildings served by geothermal ground-source heat pumps
- ☑ Received LEED for Cities and Communities (Gold certification)
- ☑ All major County facilities served by energy-saving HVAC control systems
- ☑ Updating County lighting to LED using County's Sustainability Fund and Duke Energy's Small Business Energy Saver Program
- ☑ Policy of installing solar on all new County capital projects, where feasible

TRANSPORTATION

- ☑ Updated Orange County Transit Plan in 2020
- ☑ Operates a network of 23 free electric vehicle charging stations
- ☑ Employee commute reduction programs are in place
- ☑ Operates County Commuter Options program offering alternatives to single-occupancy vehicle travel for the community
- ☑ Transitioned 7 county vehicles to all electric; 10 more on order

RESOURCE CONSERVATION

- ☑ Installed aerators on all bathroom and breakroom fixtures at County facilities to conserve water
- ☑ Created a dedicated Recycling Education & Outreach Coordinator position
- ☑ Achieved an approximately 60% increase is waste diversion compared to 1990 levels
- ☑ Developed Lands Legacy Program in 2000
- ☑ Diverted over 1,200 surplus county computers for re-use by an Orange County student training program
- ☑ Established a Waste Wise Event Program to reduce trash at County staff events

GREEN COMMUNITY

- ☑ Ordinances in place to preserve 33% of acreage from new developments
- ☑ Rainwater collection systems built at County's Animal Services facility
- ☑ 35% of County land area has designated green stormwater infrastructure

RESILIENT COMMUNITY

- ☑ The County participated in the Triangle Regional Resilience Assessment (completed in 2018)
- ☑ Updating the FEMA Hazard mitigation Plan now
- ☑ Updated the County's State of the Environment Report in 2019
- ☑ Offers Orange County Mobility on Demand rideshare services to Cooling Centers during extreme heat days
- ☑ Continues to pursue hazard mitigation action items including acquiring structures in floodplains and returning the land to green space.
- ☑ Adopted the Eno Haw Regional Hazard Mitigation Plan in 2020 and continued to participate in five year update cycles

GOVERNANCE

- ☑ The Board of County Commissioners voted to uphold the Paris Agreement
- ☑ Conducted greenhouse gas inventories in 2005 and 2017
- ☑ Providing staff support for the Commission for the Environment

FINANCE

- ☑ The Community Climate Action grant program, financed from a ¼ cent property tax, has provided funding for a variety of climate action projects including weatherization, solar installations, tree plantings, EV charger installations, LED lights, heat pump water heater replacements, compost monitors at farmer's markets, and more.
- ☑ The County has provided low-to-moderate (LMI) income funding through the Solarize the Triangle program to fund solar installations for LMI households.

THINGS YOU CAN DO YOURSELF

While governments and corporations can make significant mitigation impacts in the way they operate, individuals can make a difference in the way we live our daily lives. Our decisions give us the power to set a course for change by taking small actions that cause rippling effects across communities and can build dialogues that lead to broad behavior change. Join Orange County as it sets a course for community-wide climate change.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

ENERGY PLEDGE TO:

- ☑ Turn off the lights when you leave if your home or office does not have occupancy sensors
- ☑ Skip the elevator and take the stairs for exercise and energy savings
- ☑ Unplug or use a power strip
- ☑ Obtain an energy audit for your home
- ☑ Take advantage of your energy provider's incentives for reducing your energy consumption

WATER PLEDGE TO:

- ☑ Bring a reusable water bottle to work each day
- ☑ Reduce meat consumption (biggest water user)
- ☑ Reduce water use at home and work
- ☑ Plant native plants that require less water than non natives

FOOD PLEDGE TO:

- ☑ Say no to plastic by bringing a reusable to go container to work and for restaurant leftovers
- ☑ Not ask for a straw
- ☑ Only take what you can eat
- ☑ Eat a more plant-based diet

GREEN SPACES PLEDGE TO:

- ☑ Be a good steward to the earth by planting a tree
- ☑ Convert some or all of your lawn space to native plants
- ☑ Use an electric mower or battery operated mower

PURCHASING PLEDGE TO:

- ☑ Prioritize local and minority owned farms and businesses and support those with a climate mission
- ☑ Purchase products with reduced packaging
- ☑ Make your next purchase an electric one instead of gas

TRANSPORTATION PLEDGE TO:

- ☑ Ride your bike or carpool to work
- ☑ Take public transportation as often as possible
- ☑ Telecommute when possible

WASTE PLEDGE TO:

- ☑ Reduce/eliminate use of single use plastic bags
- ☑ Reduce food waste
- ☑ Start composting
- ☑ Purchase second-hand clothing whenever possible
- ☑ Reduce paper copies and print double sided
- ☑ Fix first before buying new

ENGAGE PLEDGE TO:

- ☑ Talk and share ideas with others about climate change
- ☑ Volunteer for a community climate action project
- ☑ Stay informed and involved with what the County and region are doing to tackle climate change
- ☑ Participate in community engagement efforts around climate change

OUR IMPACT

An updated GHG Emission Inventory was conducted as part of this CAP planning process in order to understand the present state of environmental impacts and to establish a baseline for the forecasting of future emissions. The methodology was built using the US Community Protocol provided by the ICLEI ClearPath tool coupled with United States Environmental Protection Agency GHG emission factors which serve as the benchmark for GHG emission inventory analysis nationwide. Emissions were estimated based on best practices drawn from these resources. The year 2019 was selected for the GHG Emission Inventory to offer a more typical representation of GHG emissions against the year 2023, given that the COVID-19 pandemic significantly reduced travel emissions and markedly impacted emissions from other sectors as well. Notably, the years 2020, 2021, and 2022 recorded significantly lower emissions compared to current levels. A full understanding of the inventory can be found in the Appendix A: 2019 GHG Emissions Inventory .

The GHG Emission Inventory considers two distinct greenhouse gas accounting tracks: **community and government sectors**. The two tracks are considered on the following pages as distinct inventories.

COMMUNITY GREENHOUSE GAS INVENTORY

In 2019, the Orange County community produced a total of 1,631,671 metric tons of carbon dioxide equivalent emissions (MT CO2e). As illustrated in Figure B, the greatest percentage of emissions was from transportation and mobile service at 43%, or 702,701 MT CO2e. Energy use in buildings represent the next largest emission sources at 34%, 19%, and 2% respectively. Building energy use can be categorized by Commercial (business, university, and medical buildings), Residential (single and multi-family residences), and Industrial (agricultural and factory buildings) sectors to assist in determining reduction strategies. Commercial energy produced 556,800 MT CO2e, Residential energy resulted in 299,216 MT CO2e, and industrial energy contributed 33,626 MT CO2e. The remainder of the community inventory includes solid waste with 21,350 MT CO2e, water and wastewater with 12,585 MT CO2e, and fugitive emissions with 5,393 MT CO2e.

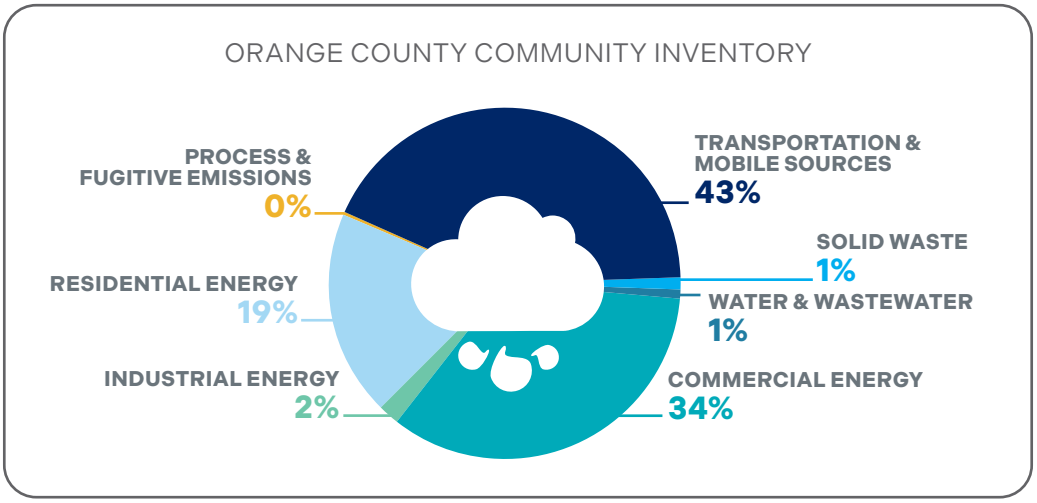


Figure B: Orange County Community Inventory

COUNTY OPERATIONS GREENHOUSE GAS INVENTORY

As shown in Figure C, county operations GHG emissions were also analyzed. Orange County local government operations (LGO) were responsible for 21,124 MT CO2e. The largest emission sources were Employee Commuting at 33% (6,329 MT CO2e), followed by the Buildings & Facilities sector with 32% (6,185 MT CO2e). Water & Wastewater electricity at 23% (4,479 MT CO2e) which the local ICLEI advisor recommended including emissions in the county operation inventory. Vehicle Fleet at 11% (2,106 MT CO2e) and Transit Fleet accounted for the remaining 1% (251 MT CO2e). Fugitive emissions produced 9 MT CO2e.

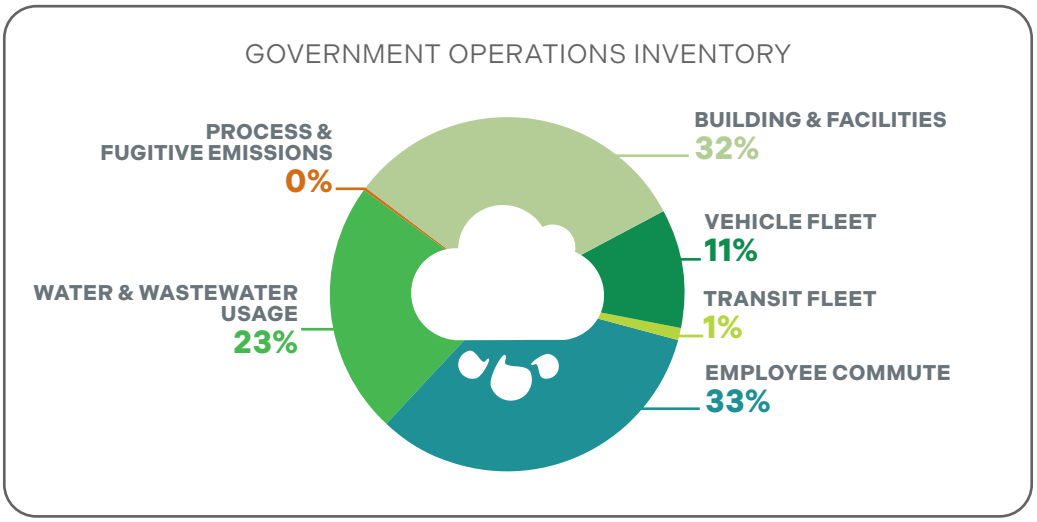


Figure C: County Operations Greenhouse Gas Inventory

IMAGE PROVIDED BY ORANGE COUNTY, NC.

GOALS

LOOKING TO 2050

IMAGE PROVIDED BY ORANGE COUNTY, NC.

GOALS
LOOKING TO 2050

EMISSIONS FORECAST

To determine what the County's emissions might look like in 2050, a series of GHG emissions forecasts were developed. As illustrated in Figure D, a Business-As-Usual forecast was developed to forecast the County's emissions without any additional action from federal, State, or local governments. A series of growth factors such as population and household growth were applied to the County's baseline emissions. Without any additional action, the County's emissions are expected to increase from 1,631,671 metric tons in 2019 to 1,813,315 metric tons in 2050.

GROWTH FACTORS

1. POPULATION GROWTH
2. ENERGY GROWTH
3. VEHICLE MILES TRAVELED
4. HOUSEHOLD GROWTH

To project the County's emissions in 2050 including the expected impacts of State and local actions, an Adjusted Business-As-Usual forecast was developed. This forecast, shown in Figure E, includes expected increases in fuel economy and building energy efficiency in North Carolina, as well as the local utility companies' commitments to 50% emissions reduction in 2030 and net zero emissions by 2050. Further methodology on the emission forecast can be found in Appendix B. The Adjusted Business as usual shows the emissions in Orange County dropping from 1,631,671 MT CO2e per year to 947,191 MT CO2e per year.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

EMISSIONS FORECAST *CONTINUED*

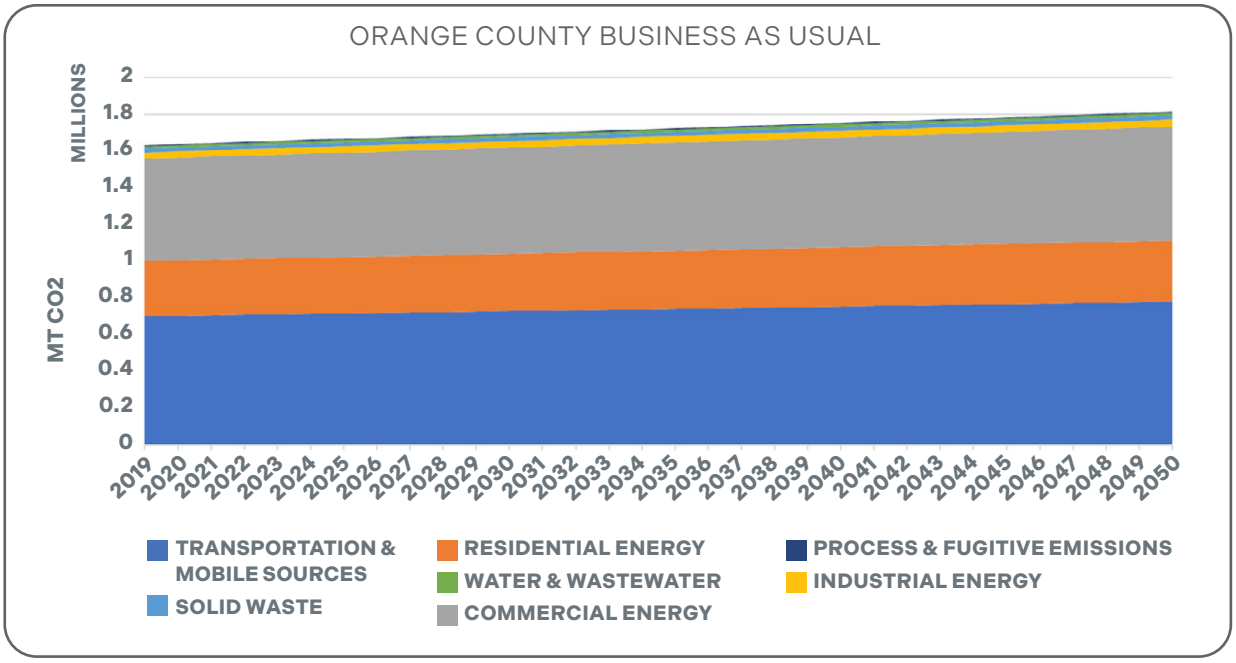


Figure D: Orange County Business as Usual

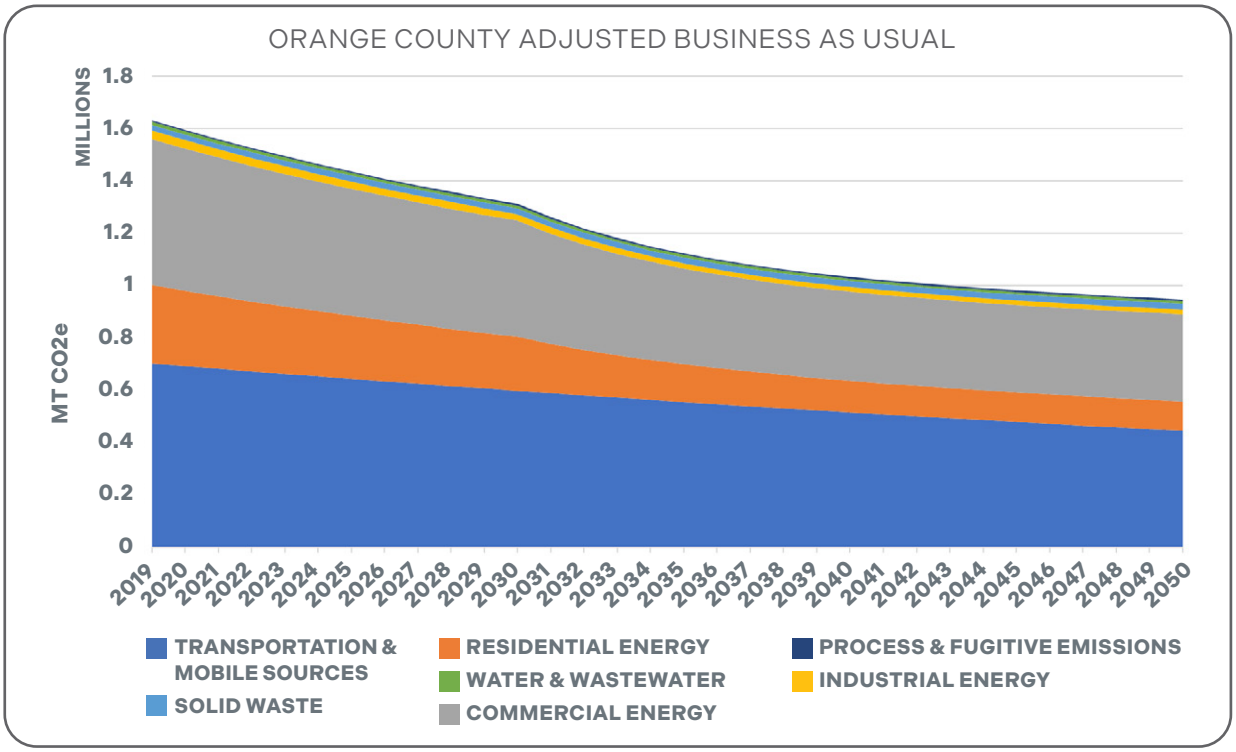


Figure E: Orange County Adjusted Business as Usual

IMAGE PROVIDED BY ORANGE COUNTY, NC.

GOALS
LOOKING TO 2050

DEVELOPMENT AND METHODOLOGY

Through quantitative and qualitative analysis, goals, strategies, and actions were identified to enable the County to form a clear path toward implementation. Some of the strategies were derived from existing programs and policies within local and regional planning documents, while others emerged as new strategies drawn from the ongoing stakeholder process and the Climate Action Team subcommittee.

CAP STRATEGY DEVELOPMENT

DEVELOPMENT PROCESS:

- Preliminary quantitative and qualitative strategies identified and agreed upon
- Development of "Long List" of CAP actions to implement each strategy
- Community and stakeholder feedback
- Further refine into a "Short List" of CAP actions
- Quantify emission reductions from actions

DEVELOPMENT TOOLS

There are two development tools that are being used to track annual progress of the CAP. ICLEI tracks the success of GHG emission reductions over time and the Climate Action Tracker acts as an internal tracking system for staff roles and responsibilities, timelines and funding approaches.

Local Governments for Sustainability is the first and largest global network of local governments devoted to solving the world's most intractable sustainability challenges. They have produced an online software platform, **ICLEI**, which tracks GHG emissions and forecasts models for strategy implementation. ICLEI also has a monitoring component, Clearpath, which can be used to report ongoing implementation of the CAP. In ICLEI ClearPath each strategy developed can be inputted and updated with real time progress of emission reductions achieved. Reports can then be exported to provide data visualizations on the progress of strategy implementation.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

GOALS
LOOKING TO 2050

DEVELOPMENT AND METHODOLOGY *CONTINUED*

The **Climate Action Tracker** combines stakeholder feedback with strategy development to determine and clearly identify what additional gaps in data or funding is needed. The Tracker functions like a workbook and serves as the single point for planning, reporting and ongoing performance monitoring. The Tracker: (1) establishes a "starting point" for future comparisons; (2) tracks strategies and actions identified in the CAP; (3) ensures contributions and actions of multiple County leaders; and (4) summarizes results and impacts. The Climate Action Tracker can be used to assign various action and reporting items to key departments responsible for reporting.

Action Steps	Milestones & Tracking	Emissions Impact	Implementation Year	Timeline [1]	Lead Department	Potential Partners	Cost Estimate
T 1.1.1 Hire a Transportation Demand Management Coordinator	Complete	Low	2028	Mid term	Transportation	Orange County Public Transportation, GoTriangle, Durham-Chapel Hill Metropolitan Planning Organization (DCHC-MPO), Chapel Hill Transit, UNC-Chapel Hill and the towns of Chapel Hill, Carrboro and Hillsborough	$320,000
T 1.1.2 Implement changes to address service gaps in Northern OC by 2030	Complete	Low					
T 1.1.3 Extend service hours by 3% and locations by 3% by 2030	% of Service Extensions	Medium					
T 1.2.1 Develop plan to transition to EV buses	Complete	High	2024	Near term	Transportation	Orange County Transportation	$500,000
T 1.2.2 Monitor and adjust off-peak schedules to ensure more frequent and reliable services.	% improvement in off-peak service reliability and frequency	Low					
T 1.3.1 Conduct a comprehensive study on successful micro-transit programs in other regions for reference and insight; (i.e.Shared bike/car/scooter programs)	Complete	Medium	2024	Near term	Transportation	TDM Coordinator, Orange County Transportation; EVS for Orange; "TransLoc." rideshare app features	$170,000
T 1.3.2 Carry out stakeholder engagement to understand local commuting needs and identify key areas that would benefit from micro-transit.	Complete	Low					
T 1.3.3 Expand Orange County Mobility on demand services in selected areas	Complete	Low					

Climate Action Tracker sample.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

DEVELOPMENT AND METHODOLOGY *CONTINUED*

PRIORITIZATION

The Climate Action Tracker provides initial priority rankings and timelines for each CAP strategy. As a primary step, each strategy is ranked by its potential impact on GHG emission reductions: **Tier 1 Foundational**, **Tier 2 Supportive**, and **Tier 3 Complementary**. Foundational strategies will be key to reducing the environmental impacts of climate change and are drawn out as immediate priorities, regardless of funding available or political will. Supportive strategies are ranked next in line and indicate strategies that have less of a GHG reduction potential but are still critical elements in reducing the environmental impacts. Complementary strategies are focused on educational strategies that are a cornerstone to the CAP's ability to succeed.

A second step is to assign co-benefits which help us understand the feasibility and effectiveness of each strategy. Four of the co-benefits are given a numerical score of 1 and ranked based on the high/medium/low impacts that each brings. The greenhouse gas reduction and equity and climate justice co-benefits are weighted higher, at 1.25%, to indicate further emphasis on these environmental and social impacts. The numerical scores are combined into a Priority Score which is highlighted after each strategy.

CO-BENEFITS KEY

GHG REDUCTION

Greenhouse Gas Reduction potential (High, medium, and low)

COST-EFFECTIVENESS

Cost-Effectiveness (Net present value, impact versus dollar spent)

COMMUNITY BENEFITS

Community Benefits (Clean air, livable community, resiliency, etc.)

EFFECTS ON THE ECONOMY

Effects on the Economy (Impacts on workforce, broad economy)

ALIGNMENT WITH STATE/LOCAL POLICIES

Alignment with State and Local Policies (EO 246, HB951, 100% renewable energy resolution)

EQUITY & CLIMATE JUSTICE

Incorporates Equity and Climate Justice (Fair distribution of resources)

IMAGE PROVIDED BY ORANGE COUNTY, NC.

GOALS
LOOKING TO 2050

COMMUNITY ENGAGEMENT

Orange County hosted a series of focus groups and workshops and embarked on a public education campaign to disseminate a public Climate Action Survey.

At the 2023 Orange County Agricultural Summit, the project team presented a baseline assessment of existing actions and potential best practices that the County could consider. Feedback centered around the need to strengthen support for young farmers and the need to increase local food networks. Breeze Farm was highlighted as a showcase property for teaching farmers various sustainability features such as agro voltaics.

In addition to an internal County staff focus group, the County initiated outreach to key community stakeholders throughout the year. The County presented two focus groups: a Business and Vendor Perspectives and a Community and Environmental Priorities focus group. The County heard critical feedback from businesses, non profits, and public agencies on how the CAP could best support the broad community in terms of resources, education and additional programming needed. A Student Voices workshop was held at UNC to learn about potential research that is happening on campus and determine if there were opportunities to leverage that research to pilot new technologies within County facilities.

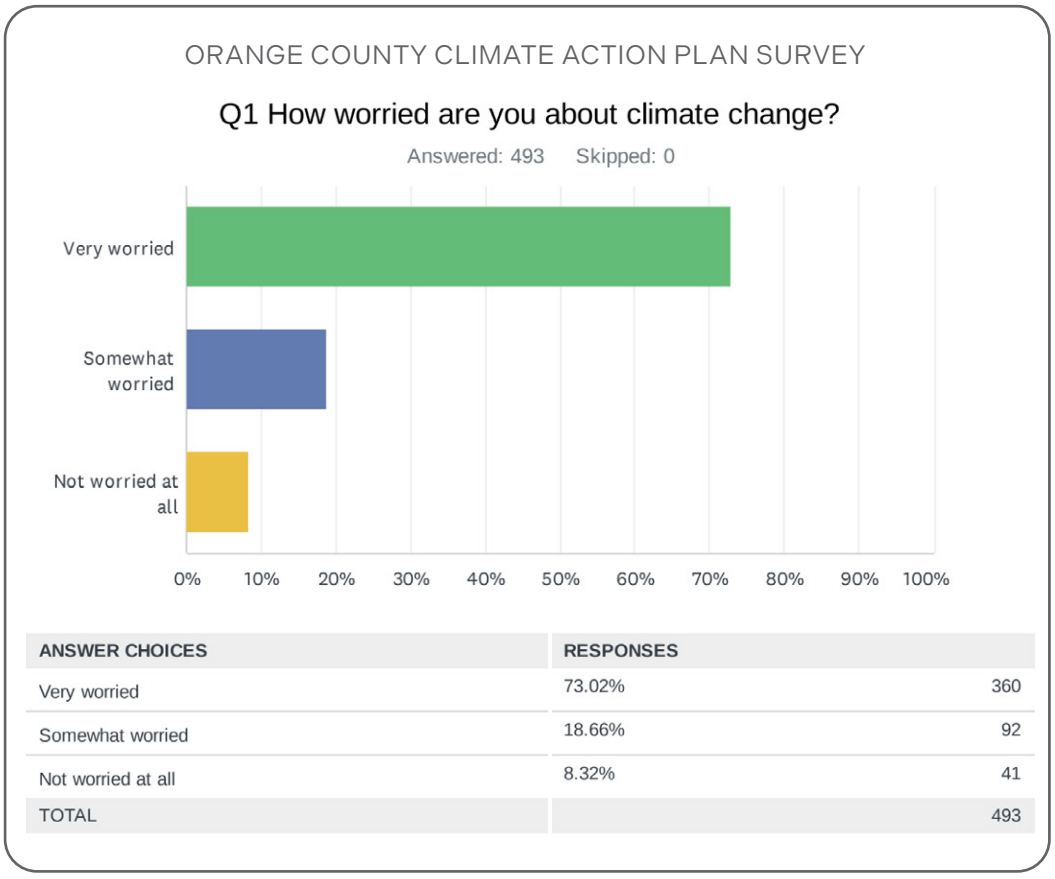
Finally, the final draft of the CAP was presented at a Community Symposium in the Fall. The public was invited to learn about the County's priorities and roadmap for implementation.

500 people participated in the County's Climate Action Survey which was distributed as a QR code at local Farmer's Market and similar outreach events in the County. Outreach examples include all three farmer's markets in Hillsborough, Chapel Hill and Carrboro, Climate Action Day at UNC, events through El Centro Hispano, Orange County Juneteenth event, and Orange County, Chapel Hill, and Carrboro city schools. In addition, the survey was sent to all Orange County churches, community groups, and targeted local businesses with physical flyers with the QR code posted at libraries, grocery stores, parks, etc. The survey was translated in Spanish, Karen, Burmese and Mandarin.

IMAGE PROVIDED BY ORANGE COUNTY, NC.

DEVELOPMENT AND METHODOLOGY *CONTINUED*

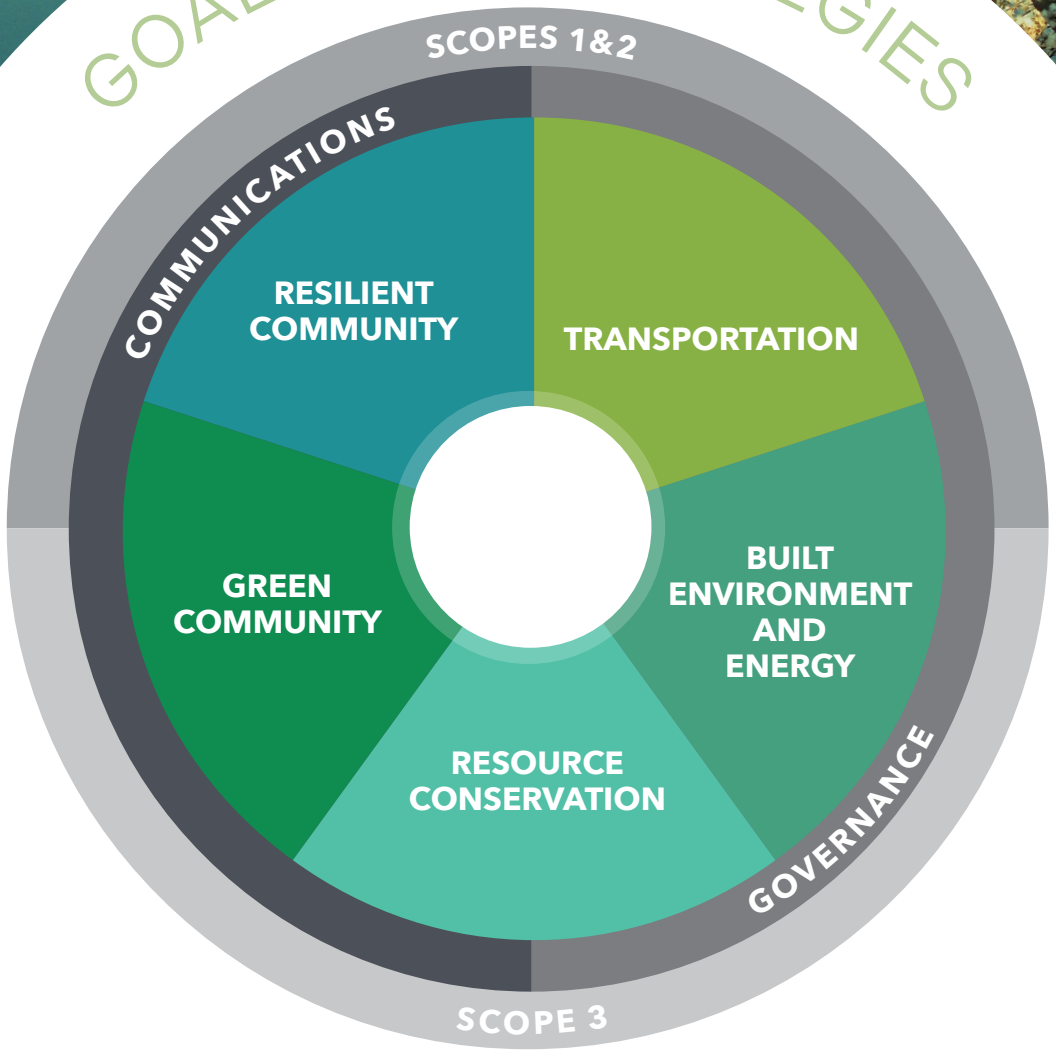
An example of the survey results is shown in Figure F. A full Stakeholder Report, outlining specific feedback received, can be found as Appendix C.



ANSWER CHOICES	RESPONSES	
Very worried	73.02%	360
Somewhat worried	18.66%	92
Not worried at all	8.32%	41
TOTAL		493

Figure F: An example of survey results

GOALS AND STRATEGIES



As part of this process, the County reviewed current policies and programs and produced a comprehensive, annotated list of high-impact strategies that could be analyzed and prioritized based on feasibility, financial considerations, health benefits, and equity. In addition, many opportunities and barriers were considered as part of this process.

TRANSPORTATION

GOALS
LOOKING TO 2050

Transportation is the largest source of emissions within Orange County, with 43% of all community emissions coming from vehicle miles traveled (VMT) and 30% of County operations emissions coming from employee commutes; therefore, reducing fossil fuel vehicle travel is imperative. By increasing active transit like walking and biking and helping create a walkable and bikeable county, public health and social connectivity will be increased. The strategies and actions in this section are designed to make alternatives to single-occupant, fossil fuel trips easy, convenient, and attractive to residents and visitors.

One of the Top 10 Things the County should do is to transition all community-wide vehicles away from fossil fuel. This follows North Carolina's Executive Order 246 which calls for an increase in registered zero-emission vehicles to at least 1,250,000 by 2030 and for 50% of sales of new vehicles in North Carolina to be zero-emission by 2030. The County expects this guidance to continue its trajectory of 100% of sales of new vehicles by 2050. To support this, the County will need to ramp up education and charging infrastructure to support this transition.

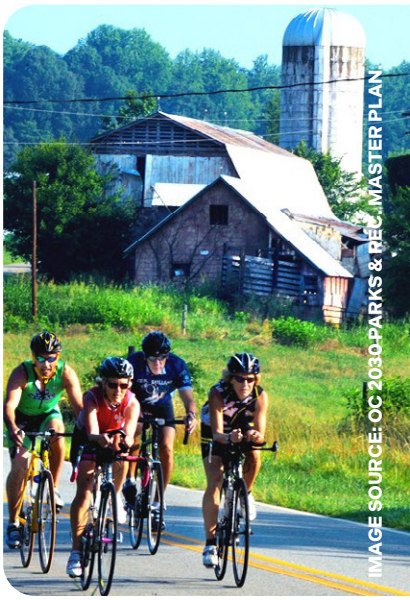


IMAGE SOURCE: OC 2030 PARKS & REC MASTER PLAN

CO-BENEFITS KEY

GHG REDUCTION

COST-EFFECTIVENESS

COMMUNITY BENEFITS

EFFECTS ON THE ECONOMY

ALIGNMENT WITH STATE/LOCAL POLICIES

EQUITY & CLIMATE JUSTICE

TRANSPORTATION

GOALS
LOOKING TO 2050

GOAL 1
T 1 ENHANCE AND DIVERSIFY PUBLIC TRANSPORTATION

TARGET
DECREASE VMT 30% FROM A 2019 BASELINE BY 2050


IMAGE SOURCE: UNSPLASH

STRATEGY	ACTION
T 1.1 Continue updating and executing the Orange County Transit Plan, addressing service gaps in Northern OC and scheduling issues **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 4.38 **CO-BENEFITS:**	**T 1.1.1** Hire a Transportation Demand Management Coordinator **T 1.1.2** Implement changes to address service gaps in Northern OC by 2030 **T 1.1.3** Extend service hours by 3% and locations by 3% by 2030
T 1.2 Transition to smaller, energy-efficient buses or vans during peak hours, providing more adequate and reliable services **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.88 **CO-BENEFITS:**	**T 1.2.1** Develop plan to transition to EV buses **T 1.2.2** Monitor and adjust peak schedules to ensure more adequate and reliable services in response to measured demand
T 1.3 Explore innovative public transportation options **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.88 **CO-BENEFITS:**	**T 1.3.1** Conduct a comprehensive study on successful micro-transit programs in other regions for reference and insight; (i.e. Shared bike/car/scooter programs) **T 1.3.2** Carry out stakeholder engagement to understand local commuting needs and identify key areas that would benefit from micro-transit **T 1.3.3** Expand Orange County Mobility on Demand services in selected areas

TRANSPORTATION

GOALS LOOKING TO 2050

GOAL 2
T 2 IMPROVE ORANGE COUNTY COMMUTER OPTIONS (OCCO) PROGRAM

TARGET
DECREASE VMT 30% FROM A 2019 BASELINE BY 2050


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
T 2.1 Initiate pilot marketing campaigns that use innovative means/ methods to inform community about public transportation options/programs/incentives **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.25 **CO-BENEFITS:**	**T 2.1.1** Partner with Health Department on messaging campaigns to emphasize health benefits of commuting (cleaner air) **T 2.1.2** Expand Orange County Commuter Options program community-wide participation by 5% annually from 2025 to 2030

STRATEGY	ACTION
T 2.2 Partner with chamber networks to develop education programs around the Orange County Commuter Options program for implementation at private businesses **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 4.88 **CO-BENEFITS:**	**T 2.2.1** Collaborate with chamber networks to host one Orange County Commuter Options program seminar annually

TRANSPORTATION

GOALS
LOOKING TO 2050

GOAL
T 3 PROMOTE CYCLING AND WALKING AS SUSTAINABLE TRANSPORTATION OPTIONS

TARGET
DECREASE VMT 30% FROM A 2019 BASELINE BY 2050


IMAGE SOURCE: OC 2030 PARKS & REC. MASTER PLAN.

STRATEGY	ACTION
T 3.1 Publicize and promote bike trails and biking as an alternative means of transportation through Parks and Recreation educational programs, special events, promotions, outreach and marketing efforts **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.88 **CO-BENEFITS:**	**T 3.1.1** Cross promote rides and educational programs with Parks and Recreation and Health Department to emphasize the health benefits of biking **T 3.1.2** Partner with local bike shops and bike clubs to provide programs on bike safety and bike rides
T 3.2 Create an e-bike subsidy program that provides higher subsidies for low income residents. Similar to what City of Raleigh and Denver have done **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 4.38 **CO-BENEFITS:**	**T 3.2.1** Develop an E-Bike Subsidy Allocation Plan: In collaboration with local stakeholders and transportation experts, develop a plan that outlines the structure of the e-bike subsidy program **T 3.2.2** Implement a Subsidy Application and Distribution Process: Create a clear and accessible application process for residents to apply for the e-bike subsidy
T 3.3 Work with NCDOT and the Towns of Carrboro, Chapel Hill, Hillsborough and Mebane to explore the opportunities for closing roads to vehicle traffic occasionally or permanently **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.63 **CO-BENEFITS:**	**T 3.3.1** Identify road closures in high traffic walkable areas of town

TRANSPORTATION

GOALS
LOOKING TO 2050

GOAL
T 4 INCREASE EV INFRASTRUCTURE AND ADOPTION

TARGET
TRANSITION THE COUNTY'S FLEET TO ALL ELECTRIC BY 2035


IMAGE SOURCE: UNSPLASH

STRATEGY

T 4.1
Continue efforts to introduce more EVs into the county's fleet

TIER: FOUNDATIONAL

PRIORITY SCORE: 3.13

CO-BENEFITS:

ACTION

T 4.1.1
Implement "EV-first" vehicle purchasing policy to ensure that EVs are considered as the primary replacement option for every vehicle

T 4.1.2
Develop an EV maintenance training program and training on how to address and provide EV road assistance

T 4.1.3
Conduct a review of charging infrastructure deployment, with an emphasis on rural connectivity, by 2025

T 4.1.4
Develop a policy to reimburse County staff who charge County vehicles at their personal residence

TRANSPORTATION

GOAL
T 4 INCREASE EV INFRASTRUCTURE AND ADOPTION (CONT.)

TARGET
INCREASE COMMUNITY EV ADOPTION TO 50% BY 2035 AND 100% BY 2050


IMAGE SOURCE: UNSPLASH

STRATEGY	ACTION
T 4.2 Accelerate the transition to EVs in the community through advocacy, education and awareness **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 5.00 **CO-BENEFITS:**	**T 4.2.1** Increase number of EV charging stations community-wide **T 4.2.2** Apply for grants for EV infrastructure expansion **T 4.2.3** Create an EV playbook for businesses detailing different levels of chargers, electrical capacity, and the process for installing EV chargers **T 4.2.4** Partner with Triangle Clean Cities and/or NC State Clean Technology Center to host an annual EV webinar/workshop for residents and commercial businesses **T 4.2.5** Add screening/landscaping/shade standards for EV charging stations **T 4.2.6** Prepare and improve our capabilities to respond to EV related emergencies

STRATEGY	ACTION
T 4.3 Explore the idea of providing rental EVs as an additional transportation option **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.88 **CO-BENEFITS:**	**T 4.3.1** Conduct feasibility study for a rental EV program **T 4.3.2** Pilot a rental EV program at a strategic location **T 4.3.3** Develop an EV ambassador program- Current EV drivers who can show off their vehicles at farmer's markets and participate in events like National Drive Electric Week to provide education/answer questions

TRANSPORTATION

GOALS
LOOKING TO 2050

GOAL
T 5 CONTINUE AND EXPAND ANTI-IDLING INITIATIVES

TARGET
INCREASE NUMBER OF SCHOOLS PARTICIPATING IN ANTI-IDLING INITIATIVES BY TWO SCHOOLS PER YEAR FROM 2031 TO 2035

STRATEGY	ACTION
T 5.1 Expand the "Driving is Exhausting" public education campaign	**T 5.1.1** Continue to partner with local schools to incorporate anti-idling signages at school drop-off/pick-up zones **T 5.1.2** Support the transition to EV buses at schools county-wide **T 5.1.3** Expand anti -idling program to other types of county vehicles such as Sheriff's Office vehicles

TIER: COMPLEMENTARY

PRIORITY SCORE: 3.13

CO-BENEFITS:

GOALS
LOOKING TO 2050

BUILT ENVIRONMENT & ENERGY

Following transportation, commercial buildings contribute the second highest emission percentage at 34% (collectively, building energy consumption represents the highest contribution of emissions in the County, however, for the purposes of the CAP, individual building sectors are attributed their own emissions). The next greatest contributor is residential energy which emits 19% of the total.

Buildings offer a unique opportunity to transition to a low carbon future. Buildings can reduce emissions in two ways. First, the energy efficiency of buildings can be improved. This reduces the need for carbon emitting energy from both electricity and natural gas. Second, gas-use equipment can be switched to electrical in both commercial and residential buildings. As utilities transition to 100% carbon-free renewable energy sources, building energy use will gradually become carbon free as a result.

To effectively manage this transition, some considerations should be kept in mind. For example, as the County and community transition their vehicles from internal combustion to all electric (EVs), EV charging stations may create spikes in energy usage for commercial and residential buildings. A concerted effort will need to be made on both the supply and demand side to ensure the transition to renewables is happening in a balanced way.

IMAGE PROVIDED BY OC, NC.

CO-BENEFITS KEY

- GHG REDUCTION
- COST-EFFECTIVENESS
- COMMUNITY BENEFITS
- EFFECTS ON THE ECONOMY
- ALIGNMENT WITH STATE/LOCAL POLICIES
- EQUITY & CLIMATE JUSTICE

BUILT ENVIRONMENT & ENERGY

GOALS
LOOKING TO 2050

GOAL
BE1 STRENGTHEN ENERGY EFFICIENCY AND CONSERVATION

TARGET
ACHIEVE 50% EMISSION REDUCTION TARGET OF ALL SCOPE 1 AND 2 EMISSIONS BY 2030 AND 100% BY 2050 USING A 2005 BASELINE

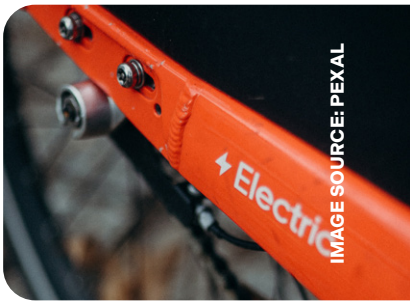


IMAGE SOURCE: PEXAL

STRATEGY

BE 1.1
Continue and strengthen policies for yearly reductions in energy use in County operations

TIER: FOUNDATIONAL

PRIORITY SCORE: 6.50

CO-BENEFITS:

ACTION

BE 1.1.1
Achieve a 20% energy usage reduction in energy consumption by 2035 using a 2019 baseline

BE 1.1.2
Install energy-efficient technologies in two County facilities each year

STRATEGY

BE 1.2
Continue the transition to efficient lighting and green infrastructure across all County facilities

TIER: FOUNDATIONAL

PRIORITY SCORE: 5.25

CO-BENEFITS:

ACTION

BE 1.2.1
Replace traditional lighting with LEDs in all county facilities by 2030

BE 1.2.2
Evaluate high energy use in two County buildings for deployment of green infrastructure measures: vertical gardens and tree plantings to reduce energy used to cool these buildings by 2030

STRATEGY	ACTION
BE 1.3 Advocate for policy-driven measures for energy efficiency in new construction for County facilities by recognizing green developers through newsletters and similar County communication networks	**BE 1.3.1** Provide an exhaustive list of all possible commercial and residential rebate programs on the County's website (BE4.1) **BE 1.3.2** Advocate for an all electric building code with the North Carolina Building Code Council

TIER: FOUNDATIONAL

PRIORITY SCORE: 5.25

CO-BENEFITS:

STRATEGY	ACTION
BE 1.4 Promote energy-saving behaviors through comprehensive education and incentive programs	**BE 1.4.1** Launch annual energy-saving education program to encourage actions such as turning off lights, powering down computers, and conducting energy audits

TIER: SUPPORTIVE

PRIORITY SCORE: 5.38

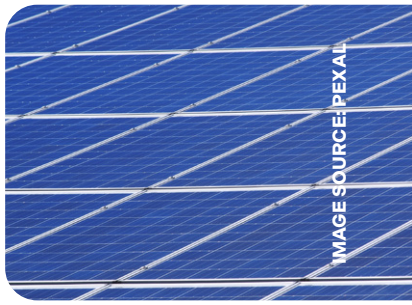
CO-BENEFITS:

BUILT ENVIRONMENT & ENERGY

GOALS LOOKING TO 2050

GOAL
BE 2 EXPAND RENEWABLE ENERGY USAGE

TARGET
ACHIEVE 100% RENEWABLE ENERGY BY 2050 IN MUNICIPAL AND COMMUNITY SECTORS



STRATEGY	ACTION
BE 2.1 Proactively adopt and expand the use of clean energy solutions within County facilities and the community **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 5.50 **CO-BENEFITS:**	**BE 2.1.1** Complete a solar siting survey for County facilities **BE 2.1.2** Consider adding electric battery storage to critical facilities and resilience hubs identified in CR 1.4.1 **BE 2.1.3** Continue with the "Solarize the Triangle" program among commercial and residential communities **BE 2.1.4** Regularly monitor, review, and comment on utility programs and legislative proposals impacting the adoption of clean energy in the County to ensure they align with the County's climate action goals **BE 2.1.5** Provide training to staff on maintenance of renewable energy systems
BE 2.2 Explore partnerships and funding opportunities to address barriers to renewable energy adoption, such as the "Solarize the Triangle" program and the Inflation Reduction Act (IRA) funding **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 6.50 **CO-BENEFITS:**	**BE 2.2.1** Participate in Duke Energy's "Green Source Advantage Choice" program to secure renewable energy from projects connected to the Duke Energy grid **BE 2.2.2** Incorporate the 10-year avoided cost bill credit option that Duke Energy is offering to receive a rebate for the cost of avoided utility infrastructure expenses **BE 2.2.3** Secure IRA funding for four renewable energy projects by 2035
BE 2.3 Leverage parking lots to apply solar canopies to increase renewable energy generation and to combat urban heat island effects **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 6.00 **CO-BENEFITS:**	**BE 2.3.1** Include analysis on locations as part of the Solar Siting Survey (BE 2.1.1)

BUILT ENVIRONMENT & ENERGY

GOALS LOOKING TO 2050

GOAL
BE 2 EXPAND RENEWABLE ENERGY USAGE

TARGET
INCREASE THE % OF COMMUNITY WIDE SOLAR BY 25% BY 2035


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
BE 2.4 Continue to release rounds of the "Solarize the Triangle" program which would work to install solar on residences, businesses and nonprofits in Orange County	**BE 2.4.1** Release rounds of "Solarize the Triangle" annually **BE 2.4.2** Designate a portion of the Community Climate Action Grant to incentivize participation in Solarize the Triangle for small businesses, nonprofits and farms

TIER: FOUNDATIONAL

PRIORITY SCORE: 6.50

CO-BENEFITS:

STRATEGY	ACTION
BE 2.5 Implement an expedited permitting process for all new solar projects across the county	**BE 2.5.1** Work with Planning Department to expedite permitting process for all new solar projects

TIER: FOUNDATIONAL

PRIORITY SCORE: 6.50

CO-BENEFITS:

STRATEGY	ACTION
BE 2.6 Schedule a Focus Group to discuss capacity and implementation of agro voltaics and community solar projects	**BE 2.6.1** Establish a Working Group as part of the annual Ag Summit **BE 2.6.2** Utilize the seed funding for County's Cooperative Extension and Sustainability to launch this discussion

TIER: FOUNDATIONAL

PRIORITY SCORE: 6.50

CO-BENEFITS:

GOALS
LOOKING TO 2050

GOAL
BE 3
PROMOTE ELECTRIFICATION

TARGET
COMPLETE AN ELECTRIFICATION STUDY AND ESTABLISH A LONG-TERM IMPLEMENTATION PLAN (PHASE 1 AND PHASE 2) FOR BOTH MUNICIPAL AND COMMUNITY INFRASTRUCTURE BY 2025


IMAGE SOURCE: PEXAL

STRATEGY	ACTION
BE 3.1 Facilitate the transition from natural gas to electricity, providing support in terms of funding, resources, and branding **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 6.50 **CO-BENEFITS:**	**BE 3.1.1** Support energy efficiency programs and partners that provide energy efficiency services and education that serve historically-disadvantaged communities by providing services and education that reduce emissions, improve standards of living, support the local economy and workforce development **BE 3.1.2** Release rounds of the "Electrify the Triangle" program which would work to install EV chargers, induction ovens, electric heat pumps, etc in the community

BUILT ENVIRONMENT & ENERGY

GOALS LOOKING TO 2050

GOAL
BE 4 ENHANCE PUBLIC EDUCATION AND ACCESSIBILITY OF RESOURCES

TARGET
STRENGTHEN THE COUNTY'S ROLE AS AN ACTIVE RESOURCE TO THE LOCAL BUSINESS AND RESIDENTIAL COMMUNITY

IMAGE SOURCE: OC 2030 PARKS & REC. MASTER PLAN.

STRATEGY	ACTION
BE 4.1 Re-design sustainability website for one-stop-shop information that educates public on the County's Climate Action Plan and sustainability practices, offering a centralized platform for information and resources **TIER:** COMPLEMENTARY **PRIORITY SCORE:** 2.50 **CO-BENEFITS:**	**BE 4.1.1** Launch the website by December 31, 2024 **BE 4.1.2** Compile a list of funding sources that local residents, businesses, or the County could potentially access to fund energy audits and energy efficiency improvements **BE 4.1.3** Develop and provide educational kits through the library and community groups to help with home energy audits and energy improvement education, summarizing information from the one-stop-shop website to create accessible resources
BE 4.2 Develop a program to support businesses in adopting sustainable practices **TIER:** SUPPORTIVE **PRIORITY SCORE:** 5.25 **CO-BENEFITS:**	**BE 4.2.1** Launch a sustainable business toolkit for businesses by 2026 **BE 4.2.2** Develop an EV playbook for businesses/homes
BE 4.3 Develop volunteer energy ambassador program. Use ambassadors to provide education about energy saving tips and resources **TIER:** SUPPORTIVE **PRIORITY SCORE:** 5.38 **CO-BENEFITS:**	**BE 4.3.1** Staff tables at outreach events; Energy ambassadors staff informational tables at local events, engaging attendees with energy-saving tips and resources **BE 4.3.2** Host a community-wide event showcasing energy conservation, featuring workshops, exhibits, and expert speakers

BUILT ENVIRONMENT & ENERGY

GOALS
LOOKING TO 2050

GOAL
BE 5 ADVANCE SUSTAINABLE BUILDING PRACTICES

TARGET
IMPROVE BUILDING PERFORMANCE WITH ALL NEW CONSTRUCTION AND DURING THE TIME OF RETROFIT


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
BE 5.1 Formalize and enhance the commitment to achieving LEED standards for County facilities	**BE 5.1.1** Follow LEED standards for two county facilities each year

TIER: SUPPORTIVE

PRIORITY SCORE: 3.13

CO-BENEFITS:

STRATEGY	ACTION
BE 5.2 Encourage the use of geothermal ground-source heat pumps in more County buildings, based on the success of current implementations	**BE 5.2.1** Evaluate geothermal heat pumps in county buildings

TIER: SUPPORTIVE

PRIORITY SCORE: 3.13

CO-BENEFITS:

STRATEGY	ACTION
BE 5.3 Invest in training and salary increases for permitting department to research green building materials/methods and do engineering work in-house to lower cost	**BE 5.3.1** Set up a Train-the-Trainer model that can be implemented County-wide

TIER: SUPPORTIVE

PRIORITY SCORE: 3.00

CO-BENEFITS:

RESOURCE CONSERVATION

GOALS
LOOKING TO 2050

While waste disposal, water use, and consumption are all essential activities in the community, disposing of natural resources generates community GHG emissions, albeit a small amount. The effects of these activities can be reduced by diverting waste from the landfill, conserving water, and promoting sustainable consumption patterns.

Orange County has access to many resources to better support a circular economy. The overarching approach to resource conservation is to create a consistent framework of outreach resources and developing public private partnerships to disseminate those resources. Conservation measures are about changing community habits and connecting them with the right solutions.

IMAGE PROVIDED BY OC, NC.

CO-BENEFITS KEY

GHG REDUCTION

COST-EFFECTIVENESS

COMMUNITY BENEFITS

EFFECTS ON THE ECONOMY

ALIGNMENT WITH STATE/LOCAL POLICIES

EQUITY & CLIMATE JUSTICE

RESOURCE CONSERVATION

GOAL
RC 1 ENHANCE WASTE REDUCTION AND RECYCLING PROGRAM

TARGET
ACHIEVE ZERO WASTE BY 2040


IMAGE PROVIDED BY OC.NC.

STRATEGY
RC 1.1
Expand the existing reuse network with partner organizations, improving the ability to divert waste and increase the reuse of items within the county

TIER: SUPPORTIVE

PRIORITY SCORE: 3.25

CO-BENEFITS:

ACTION
RC 1.1.1
Add one new partner organization to the reuse network annually; add resource to website (BE 4.1)

RC 1.1.2
Identify and Increase accepted reuse items at the county's Solid Waste Convenience Centers; report tonnage each year in overall diversion; add resource to website (BE 4.1)

RC 1.1.3
Promote Habitat for Humanity which sells new and used furniture, building materials, appliances and household goods at discounted prices; add resource to website (BE 4.1)

RC 1.1.4
Set up a recycling and donation location for old gas appliances at the County Solid Waste Convenience Centers; add resource to website (BE 4.1)

STRATEGY
RC 1.2
Partner with local businesses and nonprofit organizations to build a comprehensive reuse program for items such as pallets, takeout containers, electronics and school supplies

TIER: COMPLEMENTARY

PRIORITY SCORE: 3.25

CO-BENEFITS:

ACTION
RC 1.2.1
Regularly track and report the program's impact on waste reduction; Add resource to website (BE 4.1)

RC 1.2.2
Consider implementing a "repair café" at libraries where residents can go to get help repairing common household items and electronics to keep them in circulation longer

STRATEGY	ACTION
RC 1.3 Promote policies to eliminate non-essential single-use plastics and prioritize reusable food ware and utensils **TIER:** SUPPORTIVE **PRIORITY SCORE:** 2.00 **CO-BENEFITS:**	**RC 1.3.1** Promote a "Don't Waste Orange County" program, similar to Durham's Green to Go program

STRATEGY	ACTION
RC 1.4 Develop comprehensive educational and outreach programs in conjunction with the Solid Waste Department, encouraging waste reduction and recycling, and fostering a more informed and actively involved community **TIER:** COMPLEMENTARY **PRIORITY SCORE:** 3.25 **CO-BENEFITS:**	**RC 1.4.1** Launch annual community Zero Waste workshop in partnership with the Solid Waste Department

STRATEGY	ACTION
RC 1.5 Evaluate the potential of a curbside composting program, backed by a county-led educational campaign on the importance and benefits of composting **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.13 **CO-BENEFITS:**	**RC 1.5.1** Complete a feasibility study for a curbside composting program by 2031 as part of the County's updated waste hauler agreement **RC 1.5.2** Work with the Solid Waste Department to launch an educational campaign on composting benefits

STRATEGY	ACTION
RC 1.6 Examine the implementation of an edible food recovery program, potentially in partnership with local restaurants and food pantries **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.38 **CO-BENEFITS:**	**RC 1.6.1** Work with Cooperative Extension and other partners to expand funding to build out the food recovery program

STRATEGY	ACTION
RC 1.7 Work with the Solid Waste Department to conduct a post consumer waste audit of county facilities **TIER:** SUPPORTIVE **PRIORITY SCORE:** 2.00 **CO-BENEFITS:**	**RC 1.7.1** Select one dumpster from county facilities that would be emptied and sorted into material type **RC 1.7.2** Make a list of items that are not recyclable **RC 1.7.3** From this list, pinpoint where these non recyclable items are being generated and determine how to eliminate them completely

RESOURCE CONSERVATION

GOALS
LOOKING TO 2050

GOAL
RC 2 PROMOTE WATER CONSERVATION

TARGET
ACHIEVE 35% REDUCTION IN MUNICIPAL AND COMMUNITY WATER USAGE BY 2035 FROM 2019 BASELINE


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
RC 2.1 Continue to install water-saving devices such as aerators and dual handles in county facilities and broaden these efforts to include other water-saving technologies; in partnership with all water providers	**RC 2.1.1** Install water-saving devices in two additional county facilities annually (i.e. low flow) **RC 2.1.2** Regularly review and upgrade to newer water-saving technologies

TIER: SUPPORTIVE

PRIORITY SCORE: 2.50

CO-BENEFITS:

STRATEGY	ACTION
RC 2.2 Collaborate with educational institutions and the wider community to increase awareness about water-saving practices	**RC 2.2.1** Utilize parks and other County owned facilities as demonstration areas that also include interpretive educational signage on sustainable practices **RC 2.2.2** Distribute water-saving practice stickers in county facilities and residential properties **RC 2.2.3** Provide water conservation kits in partnership with all water providers

TIER: COMPLEMENTARY

PRIORITY SCORE: 2.00

CO-BENEFITS:

RESOURCE CONSERVATION

STRATEGY	ACTION
RC 2.3 Analyze facility design and usage to pinpoint opportunities for water conservation, including restrooms and optimized heating and cooling systems **TIER:** SUPPORTIVE **PRIORITY SCORE:** 1.50 **CO-BENEFITS:**	**RC 2.3.1** Conduct annual audits of county facilities to identify water-saving and energy-savings opportunities **RC 2.3.2** Implement identified savings measures in all facilities

STRATEGY	ACTION
RC 2.4 Transition 20% of the community water supply to recycled water by 2035 from a 2019 baseline **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.61 **CO-BENEFITS:**	**RC 2.4.1** Consider implementing a Rainwater Rewards program similar to the City of Raleigh's to help businesses and residences capture stormwater runoff, reduce flood impacts, and help prevent water pollutants from entering storm drains and streams

RESOURCE CONSERVATION

GOAL
RC 3 PROMOTE A SUSTAINABLE SUPPLY CHAIN

TARGET
STRATEGIZE AND ESTABLISH A COUNTY-WIDE SUSTAINABLE PROCUREMENT POLICY


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
RC 3.1 Transition one procurement item annually to a more sustainable option **TIER:** SUPPORTIVE **PRIORITY SCORE:** 2.00 **CO-BENEFITS:**	**RC 3.1.1** Identify item using the list from the waste audit as outlined in Action RC 1.7.1

STRATEGY	ACTION
RC 3.2 Eliminate purchasing of disposable or single-use plastics for nonessential uses for County operations **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.13 **CO-BENEFITS:**	**RC 3.2.1** Implement reuse items for break rooms and meetings/events **RC 3.2.2** Buy bulk when available

STRATEGY	ACTION
RC 3.3 Consider increasing the numbers of vendors who are small business-owned or run by people of minority identities as much as possible	**RC 3.3.1** Acknowledge the importance of this consideration during planning sessions **RC 3.3.2** Mention this acknowledgement in county grant proposals

TIER: SUPPORTIVE

PRIORITY SCORE: 2.25

CO-BENEFITS:

STRATEGY	ACTION
RC 3.4 Establish Sustainable Materials Purchasing Guidelines with a list of construction materials with low embodied GHG emissions	**RC 3.4.1** Add specific language to the RFP process to provide additional criteria points in the selection process **RC 3.4.2** Write guidelines for the Sustainable Materials Purchasing Guidelines

TIER: SUPPORTIVE

PRIORITY SCORE: 3.63

CO-BENEFITS:

GREEN COMMUNITY

GOALS
LOOKING TO 2050

Living in a green community contributes to an improved quality of life by providing a range of benefits for residents, including improved health and wellbeing, increased morale, and cleaner air. There is a mental health aspect to walking the streets lined with old growth trees and having access to a connectivity of open space. Additional community benefits include sheltering us from the intense rays of the sun, cooling temperatures, providing resilience to flooding, and using the carbon sequestration benefits that trees provide. Climate change has refocused our attention on providing a way of living that places people's long term needs as a core value. These projects also indirectly reduce GHG emissions.

IMAGE PROVIDED BY OC, NC.

CO-BENEFITS KEY

- GHG REDUCTION
- COST-EFFECTIVENESS
- COMMUNITY BENEFITS
- EFFECTS ON THE ECONOMY
- ALIGNMENT WITH STATE/LOCAL POLICIES
- EQUITY & CLIMATE JUSTICE

GREEN COMMUNITY

GOALS
LOOKING TO 2050

GOAL
GC 1 ENHANCE GREEN INFRASTRUCTURE AND SUSTAINABLE LAND USE

TARGET
PRIORITIZE AND IMPLEMENT NATURE BASED SOLUTIONS IN THE COMMUNITY


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
GC 1.1 Continue and enforce policies that preserve a significant percentage of acreage from new developments, with an emphasis on natural landscapes and native plants	**GC 1.1.1** Focus on connectivity of open space **GC 1.1.2** Support the Department of Environment, Agriculture, Parks and Recreation to develop a resource that identifies those areas of the highest natural value that should be prioritized for preservation from new developments

TIER: SUPPORTIVE

PRIORITY SCORE: 5.38

CO-BENEFITS:

STRATEGY	ACTION
GC 1.2 Reduce/eliminate amount of mowed/manicured lawns on County properties; replace with native pollinator gardens, native grasses	**GC 1.2.1** Transition landscaping at two County buildings per year beginning in 2027 **GC 1.2.2** Install rainwater collection systems in two County buildings per year beginning in 2027 **GC 1.2.3** Organize an event showcasing the County's green infrastructure

TIER: SUPPORTIVE

PRIORITY SCORE: 4.75

CO-BENEFITS:

GREEN COMMUNITY

GOALS
LOOKING TO 2050

GOAL
GC 2 INCREASE THE TREE CANOPY COMMUNITY-WIDE

TARGET
GIVEAWAY 10,000 TREE SEEDLINGS IN 10 YEARS (1,000 A YEAR)


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
GC 2.1 Create a Tree Master Plan, quantifying the value of trees to preserve and increase tree cover across the county **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.00 **CO-BENEFITS:**	**GC 2.1.1** Develop a tree master plan by 2029 **GC 2.1.2** Utilize "citizen scientist"residents to support tree inventory efforts **GC 2.1.3** Organize a bi-annual tree giveaway program, native plant sale/seed giveaways. Maintain and make available list of local native plant growers

GREEN COMMUNITY

GOALS LOOKING TO 2050

GOAL
GC 3 PROMOTE SUSTAINABLE AGRICULTURE

TARGET
REPORT ON SUSTAINABLE FARMING PRACTICES EACH YEAR


IMAGE SOURCE: PEXAL

STRATEGY

GC 3.1
Expand and promote initiatives within the agricultural space, potentially including collaborations with local farms and Orange County Master Gardeners for innovative practices like rooftop gardens and agro voltaics

TIER: COMPLEMENTARY

PRIORITY SCORE: 4.38

CO-BENEFITS:

ACTION

GC 3.1.1
Launch two new initiatives or collaborations with local farms each year; prioritize carbon sequestration projects

GC 3.1.2
Direct the public to resources from research-based organizations such as Cooperative Extension and other land-grant institutional programs

GREEN COMMUNITY

GOALS
LOOKING TO 2050

GOAL
GC 4 PROMOTE SUSTAINABLE AGRICULTURE AND LOCAL FOOD SYSTEMS

TARGET
REPORT ON EXISTING LOCAL FOOD NETWORK EACH YEAR

IMAGE SOURCE: OC 2030 PARKS & REC MASTER PLAN.

STRATEGY	ACTION
GC 4.1 Strengthen the branding and promotion of locally sourced food, linking together existing farmers' markets and creating a unified front to support an Orange County foods movement	**GC 4.1.1** Enhance branding of locally sourced food and focus on building a stronger ag tourism network **GC 4.1.2** Host gardening workshops utilizing community center gardens; promote staff/volunteer led gardens on County properties/parks that have space and especially in areas that may be considered food deserts

TIER: COMPLEMENTARY

PRIORITY SCORE: 5.38

CO-BENEFITS:

GREEN COMMUNITY

GOALS LOOKING TO 2050

GOAL

GC 5 BROADEN OUTREACH AND RESOURCES TO BETTER SUPPORT THE AGRICULTURAL INDUSTRY

TARGET

HIGHLIGHT BREEZE FARM AS BEST PRACTICE CASE STUDY

IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
GC 5.1 Encourage the use of County land for sustainable farming practices and education, leveraging Breeze Farms as a model for sustainable farming; increasing sustainable farming acres by 5% each year beginning in 2025	**GC 5.1.1** Define sustainable farming practices outlined in the U.S. Code Title 7, Section 3103 **GC 5.1.2** Provide a clearinghouse of information for farmers and funding opportunities available for implementation of sustainable farm practices through County Extension office **GC 5.1.3** Target incentives for carbon sequestration and renewable energy projects for farmers practicing sustainable farming on County land **GC 5.1.4** Promote the County's Community Garden Grant Program

TIER: SUPPORTIVE

PRIORITY SCORE: 5.38

CO-BENEFITS:

GREEN COMMUNITY

GOALS
LOOKING TO 2050

GOAL
GC 6 BROADEN OUTREACH AND RESOURCES TO BETTER SUPPORT THE COMMUNITY

TARGET
IDENTIFY PARTNERSHIPS AND INTERNAL FUNDING SUPPORT TO BUILD A MORE RESILIENT COMMUNITY


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
GC 6.1 Develop programs and educational resources to promote native landscaping and support pollinators, potentially in partnership with organizations like the Audubon Society and Master Gardeners	**GC 6.1.1** Organize community workshops on the importance of native landscaping and pollinators **GC 6.1.2** Establish a recognition program for households and businesses that adopt native landscaping

TIER: COMPLEMENTARY
PRIORITY SCORE: 3.25
CO-BENEFITS:

STRATEGY	ACTION
GC 6.2 Expand workshops and resources for rainwater capture, learning from successful programs in other regions and leveraging tools like the EPA's EnviroAtlas	**GC 6.2.1** Organize a workshop on rainwater capture each year beginning in 2024 **GC 6.2.2** Distribute free rainwater capture kits at each workshop **GC 6.2.3** Showcase rainwater capture infrastructure at the Davis Center and replicate at other park facilities

TIER: COMPLEMENTARY
PRIORITY SCORE: 3.75
CO-BENEFITS:

STRATEGY	ACTION
GC 6.3 Utilize the County's existing Lands Legacy Program to conserve important natural and cultural resources, working with the Eno-New Hope Landscape Conservation Plan and other initiatives to improve the natural environment through protection and linkage of lands and stream protection **TIER:** COMPLEMENTARY **PRIORITY SCORE:** 3.75 **CO-BENEFITS:**	**GC 6.3.1** Establish partnerships with two new initiatives each year to improve protection of lands and streams beginning in 2030 through 2035 **GC 6.3.2** Develop educational resources on land and stream protection **GC 6.3.3** Implement a volunteer program for natural environment protection

STRATEGY	ACTION
GC 6.4 Convert abandoned railroad corridors and integrate into bike/hike trail networks bringing about positive impacts on mental health, transportation emissions, and the economy **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.50 **CO-BENEFITS:**	**GC 6.4.1** Provide staff support for the implementation of the Chapel Hill-Carrboro Freight Train Trail Feasibility Study initiative **GC 6.4.2** Ensure that public transit pick up/ drop off locations are located along these networks (Action T.1.1) **GC 6.4.3** Promote the Train Trail initiative through the Parks and Recreation Department

STRATEGY	ACTION
GC 6.5 Expand Community Climate Action Grant program to provide funding to community projects that support the strategies in this CAP **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 6.50 **CO-BENEFITS:**	**GC 6.5.1** Receive Board of Commissioner approval
STRATEGY	**ACTION**
GC 6.6 Phase out off-road fossil fuel engines (landscaping and construction equipment, recreational vehicles, etc.) **TIER:** SUPPORTIVE **PRIORITY SORE:** 5.25 **CO-BENEFITS:**	**GC 6.6.1** Coordinate a swap out program for gas powered landscaping equipment with all electric **GC 6.6.2** Apply for grants that could offer subsidies for swapping out gas to all electric landscaping equipment

RESILIENT COMMUNITY

GOALS
LOOKING TO 2050

From a climate change perspective, natural variability in the climate and weather produce extreme events like droughts, wildfires, and floods over long time periods. While natural, living systems respond to and even rely on these phenomena, our dense settlement and production of greenhouse gas emissions have greatly changed climate hazards and their impacts.

From a resilient community perspective, climate impacts will not be felt equally. Some populations are more vulnerable to climate events because there is a lack of the physical or mental ability to adapt to changing conditions. Isolated individuals have a more difficult time receiving warnings and emergency services and may depend on sources of food, water, and energy that are more subject to interruption.

As part of the Top 10 things the County should do, County operations needs to be prepared for climate change. The County should identify ahead of time and prioritize considerations around vulnerable populations and ensure that all decisions made moving forward Integrate sustainability as a framework within the overall County's planning process.

IMAGE PROVIDED BY OC, NC.

CO-BENEFITS KEY

- GHG REDUCTION
- COST-EFFECTIVENESS
- COMMUNITY BENEFITS
- EFFECTS ON THE ECONOMY
- ALIGNMENT WITH STATE/LOCAL POLICIES
- EQUITY & CLIMATE JUSTICE

RESILIENT COMMUNITY

GOALS
LOOKING TO 2050

GOAL
CR 1 BE PREPARED FOR CLIMATE CHANGE

TARGET
INTEGRATE ADAPTATION INTO EMERGENCY PREPAREDNESS AND RESPONSE

STRATEGY	ACTION
CR 1.1 Continue updating the FEMA Hazard Mitigation Plan and ensure effective implementation of the Eno-Haw Regional Hazard Mitigation Plan **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.75 **CO-BENEFITS:**	**CR 1.1.1** Conduct annual reviews and updates of the Eno-Haw Regional Hazard Mitigation Plan **CR 1.1.2** Organize quarterly meetings with stakeholders to assess the implementation of the Eno-Haw Regional Hazard Mitigation Plan **CR 1.1.3** Produce an annual report on mitigation plan progress, seeking a 5% improvement each year beginning in 2030 **CR 1.1.4** Seek funding through FEMA hazard mitigation grants

STRATEGY	ACTION
CR 1.2 Develop and promote a clear communication plan for underserved communities during climate threats, leveraging social media, community leaders, non-profits, and churches **TIER:** FOUNDATIONAL **PRIORITY SCORE:** 3.25 **CO-BENEFITS:**	**CR 1.2.1** Develop a comprehensive communication plan for climate threats by 2026 **CR 1.2.2** Partner with at least four community leaders, nonprofits and schools annually to disseminate the communication **CR 1.2.3** Conduct monthly training sessions on the use of social media for climate threat communication

STRATEGY	ACTION
CR 1.3 Implement a program for discounted battery powered generators for lower-income residents with health issues who may be affected by power outages **TIER:** SUPPORTIVE **PRIORITY SCORE:** 2.75 **CO-BENEFITS:**	**CR 1.3.1** Develop and implement a program offering discounted generators to at least eight lower-income residents per year beginning in 2032 **CR 1.3.2** Organize an annual information campaign about the electric-powered generator discount program

STRATEGY	ACTION
CR 1.4 Identify, fund, and prepare existing and new public facilities to serve as resilience hubs **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.75 **CO-BENEFITS:**	**CR 1.4.1** Identify potential public facilities that can serve as resilience hubs by 2030 and amend the Unified Development Ordinance to allow for these by right in certain zoning districts **CR 1.4.2** Prioritize the allocation of funding for preparation of these facilities **CR 1.4.3** Organize resilience hub preparation and training sessions for facility staff

GOALS
LOOKING TO 2050

GOAL
CR 2 INVEST IN INFRASTRUCTURE FOR CLIMATE RESILIENCE

TARGET
EXPAND COUNTY BUDGET TO INCLUDE CLIMATE RESILIENCE EXPENDITURES


IMAGE PROVIDED BY OC, NC

STRATEGY	ACTION
CR 2.1 Expand the use of green infrastructure to manage stormwater runoff, considering incentives to encourage implementation in local neighborhoods **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.75 **CO-BENEFITS:**	**CR 2.1.1** Develop a five-year plan to disincentivize the use of wet ponds **CR 2.1.2** Partner with higher education resources within the County (UNC-CH, Durham Tech) to perform research and test pilot programs aimed at creating resilience with climate change. Plan for one research project per year beginning in 2027

STRATEGY	ACTION
CR 2.2 Assess strategies for reducing impacts of climate change on municipal and community infrastructure **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.75 **CO-BENEFITS:**	**CR 2.2.1** Develop and implement comprehensive riparian ecosystem restoration plan and relevant floodplain management policies **CR 2.2.2** Partner with Arts Commission to create murals using heat reflective paint on County properties that do double duty as a resiliency measure but also to inform and educate the community about climate change and its impacts **CR 2.2.3** Do a study to evaluate reducing unnecessary parking spaces to decrease impervious surfaces and create more green spaces on County property only **CR 2.2.4** Promote light-colored roofs and/or a minimum specified reflectance for commercial roofs when new or at replacement **CR 2.2.5** Promote alternative cooling strategies like shade trees, green roofs, and building awnings. Determine and enact standards for new buildings (supportive of BE 1.2.2)

RESILIENT COMMUNITY

GOALS LOOKING TO 2050

GOAL
CR 3 PROMOTE CLIMATE RESILIENCE EDUCATION AND AWARENESS

TARGET
TRACK OUTREACH EFFORTS AND INCLUDE NUMBERS IN ANNUAL PROGRESS REPORTING


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
CR 3.1 Develop programs to educate the public on climate impacts **TIER:** COMPLEMENTARY **PRIORITY SCORE:** 3.25 **CO-BENEFITS:**	**CR 3.1.1** Organize annual public events to increase climate impact awareness **CR 3.1.2** Establish partnerships with at least two schools or community organizations like Urban Sustainability Solutions who can support rain garden installations and green infrastructure education in the community
CR 3.2 Disseminate climate resilience information to the business community through newsletters and regular networking events **TIER:** COMPLEMENTARY **PRIORITY SCORE:** 3.75 **CO-BENEFITS:**	**CR 3.2.1** Provide climate resiliency information in newsletters geared for the business community **CR 3.2.2** Organize bi-annual networking events focused on climate preparedness and resiliency **CR 3.2.3** Promote the sustainable business toolkit
CR 3.3 Follow through on recommendations from the Triangle Regional Resilience Assessment, ensuring its findings are acted upon and incorporated into ongoing climate resilience efforts **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.25 **CO-BENEFITS:**	**CR 3.3.1** Utilize the Climate Action Tracker to record progress on the Triangle Regional Resilience Assessment planning document **CR 3.3.2** Identify areas most vulnerable to the effects of extreme heat; prioritize tree plantings in these areas **CR 3.3.3** Monitor and report annually on the implementation of the Resilience Assessment recommendations

RESILIENT COMMUNITY

GOALS
LOOKING TO 2050

GOAL
CR 4 IMPLEMENT MEASURES TO REDUCE HEAT AND DROUGHT IMPACT

TARGET
INTEGRATE CLIMATE RISK SOLUTIONS IN ALL COUNTY PLANNING EFFORTS


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
CR 4.1 Conduct a Heat Island Mapping Study **TIER:** SUPPORTIVE **PRIORITY SCORE:** 2.75 **CO-BENEFITS:**	**CR 4.1.1** Encourage the usage of reflective paint, installation of misters in outdoor spaces, and the planting of trees in areas that the heat island study identifies as needing relief from urban heat island effects

STRATEGY	ACTION
CR 4.2 Encourage and prioritize the conservation of green spaces in the County to serve as natural buffers against climate impacts, continuing the goal of conserving a significant portion of total County land area **TIER:** SUPPORTIVE **PRIORITY SCORE:** 5.50 **CO-BENEFITS:**	**CR 4.2.1** Monitor and report annually on the progress of this Joint Planning Agreement initiative

STRATEGY	ACTION
CR 4.3 Expand green infrastructure (GI) program to reduce impermeable surface areas and capture runoff from paved areas **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.00 **CO-BENEFITS:**	**CR 4.3.1** Implement permeable, GI alternatives to paving in sidewalks, parking lots and driveways

RESILIENT COMMUNITY

GOALS LOOKING TO 2050

GOAL
CR 5 BUILD A MORE ROBUST EMERGENCY RESPONSE NETWORK

TARGET
IDENTIFY AND PRIORITIZE ACTIONS TARGETED TO VULNERABLE POPULATIONS WITHIN THE COUNTY


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
CR 5.1 Continue outreach and comprehensive care strategies for vulnerable populations **TIER:** COMPLEMENTARY **PRIORITY SCORE:** 3.25 **CO-BENEFITS:**	**CR 5.1.1** Use the Department of Social Services' registry to continue to access populations with special needs during the time of disasters **CR 5.1.2** Conduct survey of and outreach to vulnerable populations (e.g. isolated seniors, outdoor workers, long-term care residents) and the people and institutions that care for them **CR 5.1.3** Collaborate with community-based organizations to develop an inventory of locations with isolated seniors and develop a plan for a social support network during heat waves, bad air quality days, and other emergencies **CR 5.1.4** Expand the Steps to Neighborhood Preparedness Program that helps communities connect and build neighborhood emergency plans

RESILIENT COMMUNITY

GOALS LOOKING TO 2050

GOAL
CR 6 INCORPORATE CLIMATE ACTION INTO COUNTY POLICY, BUDGET, AND PLANNING

TARGET
INTEGRATE SUSTAINABILITY AS A FRAMEWORK WITHIN THE OVERALL COUNTY'S PLANNING PROCESS


IMAGE PROVIDED BY OC, NC.

STRATEGY	ACTION
CR 6.1 Incorporate climate preparedness into County programs, operations, and maintenance protocols **TIER:** SUPPORTIVE **PRIORITY SCORE:** 3.75 **CO-BENEFITS:**	**CR 6.1.1** Ensure that maintenance reflects expected future climate conditions and variability and not historical climate data for all County buildings, facilities, structures, and infrastructure **CR 6.1.2** Establish an interdepartmental working group to integrate climate preparedness in planning, maintenance, and capital improvements through the development of work plans, screening of capital improvements, and cross-sector collaboration **CR 6.1.3** Develop a "Green Team" whose purpose is to educate departments on implementing sustainable practices
CR 6.2 Integrate CAP goals into County projects as an order of business **TIER:** SUPPORTIVE **PRIORITY SCORE:** 4.25 **CO-BENEFITS:**	**CR 6.2.1** Integrate annual CAP report goals during the budget review process at the direction of the Board of County Commissioners. Plan to inventory GHG emissions every two years and track against targets
CR 6.3 Provide funding for more sustainability staff in order to implement strategies and provide community outreach **TIER:** SUPPORTIVE **PRIORITY SCORE:** 5.00 **CO-BENEFITS:**	**CR 6.3.1** Evaluate staffing levels needed to implement CAP strategies

IMAGE PROVIDED BY OC, NC.

IMPLEMENTATION AND REPORTING

OVERVIEW

The Commission for the Environment (CFE) is a citizen advisory board, composed of 15 members who are appointed by the Board of County Commissioners. The CFE's primary responsibility is to advise the Board of County Commissioners on matters related to the environment. The CFE will act as an oversight committee, working with the Sustainability Manager, as the implementation and reporting process unfolds.

Sustainability is inherently wide-ranging and not every action can be implemented at once. Some strategies can start immediately while other strategies, such as policies and regulations, rely on staff putting time in up front. Other strategies like capital investments involve a long term series of steps from project scoping and procurement, to planning, design, and construction.

Many of the actions will be dependent upon the allocation of staff time and resources, and budget prioritization. The plan identifies a responsible department for each strategy and offers timeframes and relative costs associated with each policy. The Sustainability Manager will monitor implementation progress using implementation and monitoring tools outlined in this CAP and will report to the Board of Commissioners on annual progress. As part of annual progress reports, the Sustainability Manager will evaluate the effectiveness of each strategy to ensure that anticipated emissions reductions are occurring. In the event that reductions do not occur as expected, Orange County can modify and add policies or actions to ensure the target is achieved.

Not everything will necessarily be easy or work perfectly the first time, and perseverance will be important. It will also be important to maintain flexibility in implementing the CAP. As technologies, business models, and political agendas across all levels of government evolve, Orange County will need to remain flexible in "when" and "how" it implements the actions in this plan. As costs and feasibility change, the county will periodically evaluate and adjust course as necessary. Similarly, as progress towards key targets is tracked, the county may need to scale up or down its efforts, depending on the results observed. The County should update the CAP in 2029 and 2034, respectively, and report every year on progress towards their goals.

REPORTING TOOL

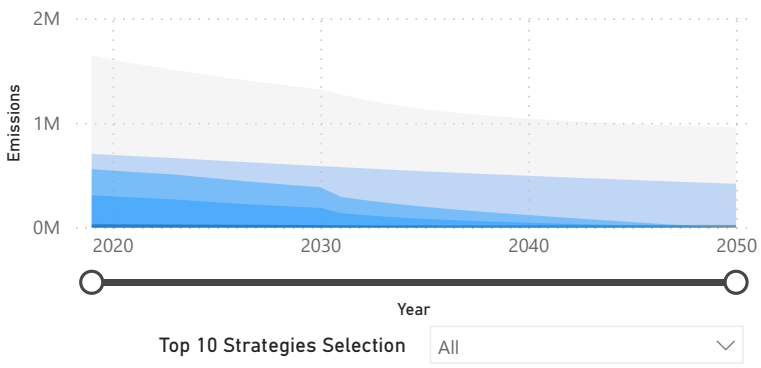
An online dashboard has been designed for Orange County to serve as a public-facing platform to report on the progress of GHG reduction efforts. This intuitive dashboard showcases various graphs depicting the emissions' progression in alignment with the GHG reduction goals. Users can probe specific data spanning from 2019 to 2050, choosing an emission strategy, and exploring results within diverse sectors such as Energy, Transportation, and Waste. Strategies are presented against an Adjusted Business As Usual (ABAU) scenario, which captures reductions achieved through third-party interventions.

The dashboard also illustrates the County's commitment and impact by adopting mitigation strategies throughout 2023-2050. A distinguishing feature allows for a visual comparison of each strategy's influence on the cumulative emissions for this period. Various charts on the platform show emission distributions across different sectors for select scenarios. Notably, the dashboard's second segment presents a map spotlighting climate-centric activities throughout Orange County. Refer to Figure G.

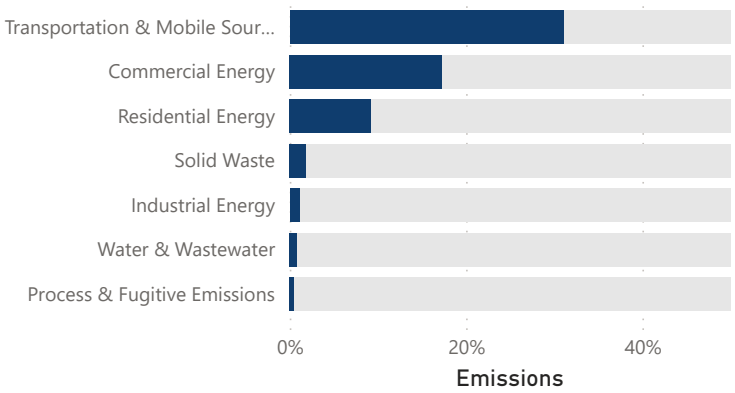
ORANGE COUNTY TOP 10 EMISSION REDUCTION STRATEGIES

Figure G: We are keeping as a placeholder and presenting the dashboard for the final CAP

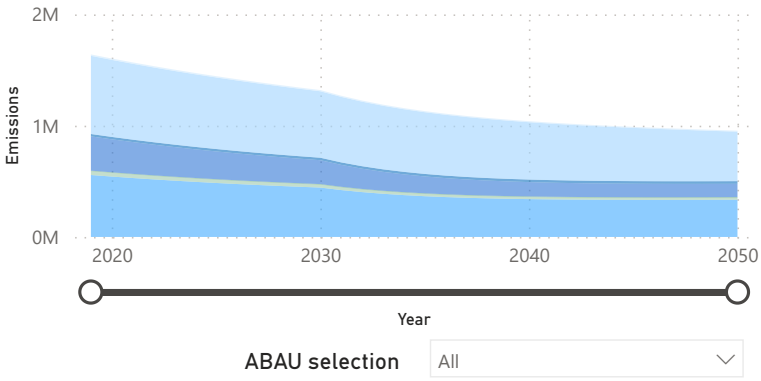
TOP 10 STRATEGIES



STRATEGIES VS. TOTAL EMISSIONS

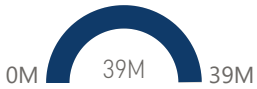


ADJUSTED BUSINESS AS USUAL (ABAU)

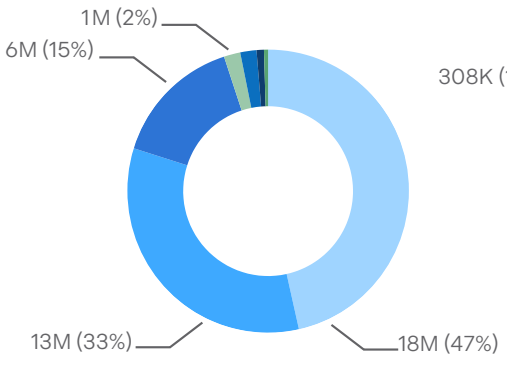


STRATEGIES SAVE

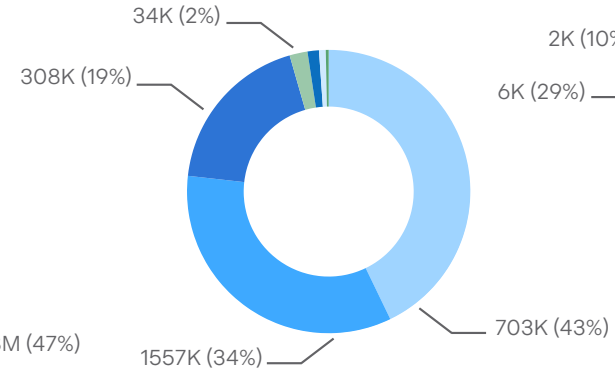
EMISSIONS PRODUCED (ABAU)



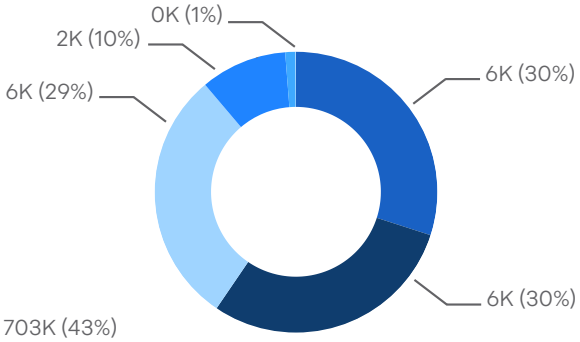
TOTAL EMISSIONS (ABAU)



COMMUNITY EMISSIONS



LGO EMISSIONS



BUDGET

In 2019, the Board of Commissioners created the Community Climate Action Grant Program (CCAG) to help meet adopted goals that would uphold the Paris Agreement and achieve 100% renewable energy by 2050. The Community Climate Action Grant Program provides funding for impactful public, non-profit, and small business projects, such as solar power at school districts and weatherizing affordable housing. The County will allocate a portion of those funds to incentivize participation in climate action projects identified within the CAP.

In addition to the grant program, a review of the Sustainability budget will need to be revisited.

FUNDING PLAN

Securing the necessary funding to effectively execute the CAP demands a diverse range of funding strategies and avenues. An integral facet of this financial approach is identifying potential external funding sources, particularly for actions that require additional support. Recognizing that certain strategies might surpass the County's current resources, tapping into external funding becomes essential. Within this framework, specific funding sources are identified where known. The implementation year for each strategy is selected based on the prioritization score, as well as the Top 10 commitments, as introduced in the CAP's Executive Summary. An imminent implementation year signifies a high prioritization score for that strategy, while a later year means a comparatively lower score.

The cost estimates are indicative only; they are based on preliminary assessments, comparisons with similar programs, and expert input and are meant to provide a rough order of magnitude evaluation. For example, several of the strategies involve efforts of County staff. In these cases a percentage of a staff's time, reflected as a portion of a "full time equivalent" has been estimated. In other cases, estimated costs of newly purchased goods and services are used.[2] An inflation factor of 3% year-over-year was applied to the estimated costs.

[2] The full description for all costs has been provided to the County, in a Climate Action Tracker, which accompanied this CAP, and is available upon request.

FUNDING PLAN CONTINUED

The financial details are organized into two tables. Table B outlines the total estimated costs by focus area that are needed over the next nine years, adding together the costs of all strategies related to that focus for the given year. On the other hand, Table C shows the total estimated costs needed for each primary goal, summing up the costs of the strategies supporting these goals.

For a more comprehensive outline of funding mechanisms, costs, sources, and an Implementation Schedule, refer to Appendices D-G, which aligns each strategy with its corresponding funding source(s).

IMPLEMENTATION YEAR	FOCUS AREA	TOTAL ESTIMATED COSTS
2024	Transportation	$1,080,000
	Built Environment and Energy	$535,000
	Resource Conservation	$159,000
	Green Community	$700,000
	Climate Resilience	$175,000
2025	Transportation	-
	Built Environment and Energy	$216,300
	Resource Conservation	$175,100
	Green Community	$82,400
	Resilient Community	$61,800
2026	Transportation	-
	Built Environment and Energy	$716,108
	Resource Conservation	$27,583
	Green Community	$265,225
	Resilient Community	$36,071
2027	Transportation	$10,927
	Built Environment and Energy	-
	Resource Conservation	$54,636
	Green Community	$120,200
	Resilient Community	$103,809
2028	Transportation	$922,917
	Built Environment and Energy	-
	Resource Conservation	$118,178
	Green Community	$28,138
	Resilient Community	$33,765

Table B: Total Estimated Costs by Focus Area

FUNDING PLAN CONTINUED

IMPLEMENTATION YEAR	FOCUS AREA	TOTAL ESTIMATED COSTS
2029	Transportation	$289,819
	Built Environment and Energy	-
	Resource Conservation	-
	Green Community	$127,520
	Resilient Community	-
2030	Transportation	$238,810
	Built Environment and Energy	-
	Resource Conservation	$167,167
	Green Community	$89,554
	Resilient Community	$330,752
2031	Transportation	$24,597
	Built Environment and Energy	$860,912
	Resource Conservation	$67,643
	Green Community	$49,195
	Resilient Community	$66,413
2032	Transportation	-
	Built Environment and Energy	$240,686
	Resource Conservation	-
	Green Community	-
	Resilient Community	$164,680

Table B: Total Estimated Costs by Focus Area (continued from page 82)

FUNDING PLAN CONTINUED

Table C outlines the total estimated costs that are needed by each core goal.

	CORE GOALS	ESTIMATED COST
TRANSPORTATION	T1. Enhance and Diversify Public Transportation	$1,030,163
	T2. Improve Orange County Commuter Options (OCCO) Program	$30,000
	T3. Promote Cycling and Walking as Sustainable Transportation Options	$812,492
	T4. Increase EV Infrastructure and adoption	$669,819
	T5. Continue and Expand Anti-idling Initiatives	$24,597
BUILT ENVIRONMENT & ENERGY	BE1. Strengthen Energy Efficiency and Conservation	$488,570
	BE2. Expand Renewable Energy Usage	$200,100
	BE3. Promote Electrification	$350,000
	BE4. Enhance Public Education and Accessibility of Resources	$504,744
	BE5. Advance Sustainable Building Practices	$1,025,592
RESOURCE CONSERVATION	RC1. Enhance waste reduction and recycling program	$401,498
	RC2. Promote water conservation	$355,870
	RC 3. Promote a sustainable supply chain	$11,941
GREEN COMMUNITY	GC1. Enhance Green Infrastructure and Sustainable Land Use	$120,200
	GC2. Increase the tree canopy community-wide	$127,520
	GC3. Promote Sustainable Agriculture	$28,138
	GC4. Promote Sustainable Agriculture and Local Food Systems	$41,200
	GC5. Broaden outreach and resources to better support the agricultural industry	$41,200
	GC6. Broaden outreach and resources to better support the community	$1,103,974
RESILIENT COMMUNITY	CR1. Be prepared for climate change	$456,224
	CR2. Invest in Infrastructure for Climate Resilience	$103,809
	CR3. Promote Climate Resilience Education and Awareness	$112,119
	CR4. Implement Measures to Reduce Heat and Drought Impact	$125,138
	CR5. Build a more robust emergency response network	$15,000
	CR6. Incorporate climate action into County policy, budget, and planning	$160,000

Table C: Estimated cost by core goal

IMAGE PROVIDED BY OC, NC

APPENDICES

Appendix A: 2019 Greenhouse Gas Emission Inventory Report

ORANGE COUNTY
NORTH CAROLINA

Table of Contents

Executive Summary

INTRODUCTION

The goal of this report is to provide an inventory of greenhouse gas (GHG) emissions that are attributable to human activities in Orange County, North Carolina. This report acts as a foundational document for the 2023 climate action plan, which provides a roadmap for reducing carbon emissions while preserving the living standards of county residents. A GHG inventory describes the primary sources of emissions within the county, including those originating from residents, commercial enterprises, and governmental operations. The emissions studied can be either direct or indirect. Direct emissions are those emitted at the location of use such as natural gas combustion in heating buildings, whereas indirect emissions are purchased and used at one location but generated elsewhere, such as those originating from the electrical grid[1]. A GHG inventory is crucial for creating strategies and programs that reduce future emissions and providing insight into the environmental condition of the county during the study year. This report was reviewed by the International Council for Local Environmental Initiatives (ICLEI) for completeness and accuracy to ensure its reliability as a foundation for informed decision-making and action.

This GHG inventory analyzes two different tracks, which are presented separately. The community track encompasses all Orange County residents, including businesses, individuals, and industrial emissions sources. Community emissions were divided into sectors: commercial, residential, and industrial energy; transportation and mobile services; solid waste; and water and wastewater. The county government operations track includes the emissions related to Orange County government activities, including government facilities, vehicle fleets, and employee commuting. The County operations inventory is a subset of the community inventory, and has specific usage portioned out from the community inventory. This report relies on the best available data to date. If certain data could not be collected, best estimates were used. Emission factors were compiled for each sector from reliable sources, such as the Environmental Protection Agency (EPA) and the US Community Protocol, which update information regularly. This GHG inventory offers a reliable reflection of real-world emissions in Orange County. All calculations were made using the US Community Protocols for Greenhouse Gas Accounting studies, as published by ICLEI[2]. Two appendices are included in this report. Appendix A lists raw usage data collected from utilities and other sources, while Appendix B provides a detailed methodology of all calculations used in determining emission totals.

[1] https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance

[2] U.S. Community Protocol for Accounting And Reporting of GHG Emissions Version 1.2 July 2019 ICLEI–Local Governments for Sustainability USA

COMMUNITY INVENTORY RESULTS

In 2019, the Orange County community produced a total of 1,631,671 metric tons of carbon dioxide equivalent emissions (MT CO2e). As illustrated in the figure below, the greatest percentage of emissions was from transportation and mobile service at 43%, or 702,701 MT CO2e. Energy use (which includes electricity and natural gas) in commercial buildings represents the next largest source at 34%, and energy from residential use followed, contributing 19%. Industrial energy use contributed just 2%. In terms of total amounts, commercial energy produced 556,800 MT CO2e, residential energy resulted in 299,216 MT CO2e, and industrial energy contributed 33,626 MT CO2e. The remainder of the community inventory includes solid waste with 21,350 MT CO2e, water and wastewater with 12,585 MT CO2e, and fugitive emissions with 5,393 MT CO2e.

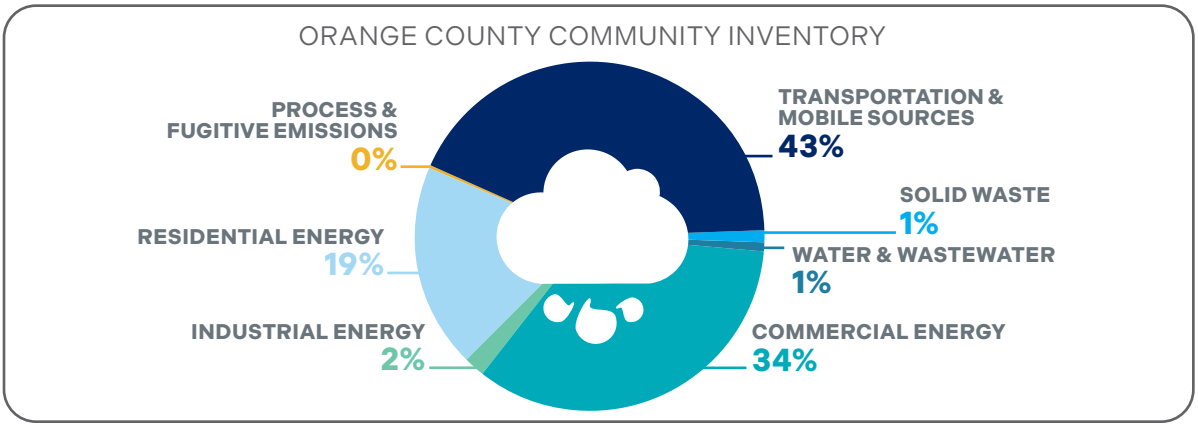


Fig. 1: Orange County 2019 community inventory by sector

COUNTY OPERATIONS INVENTORY RESULTS

County operations GHG emissions were also analyzed. Orange County government operations were responsible for 19,359 MT CO2e. The largest emission sources were employee commuting at 33% (6,329 MT CO2e). Buildings and Facilities contributed 32%, with 6,185 MT CO2e. Water and Wastewater treatment facilities at 23% (4,479 MT CO2e) followed by Vehicle Fleet at 11% with 2,106 MT CO2e. The Transit Fleet accounted for the remaining 1% (251). Fugitive emissions produced 9 MT CO2e (less than 1%).

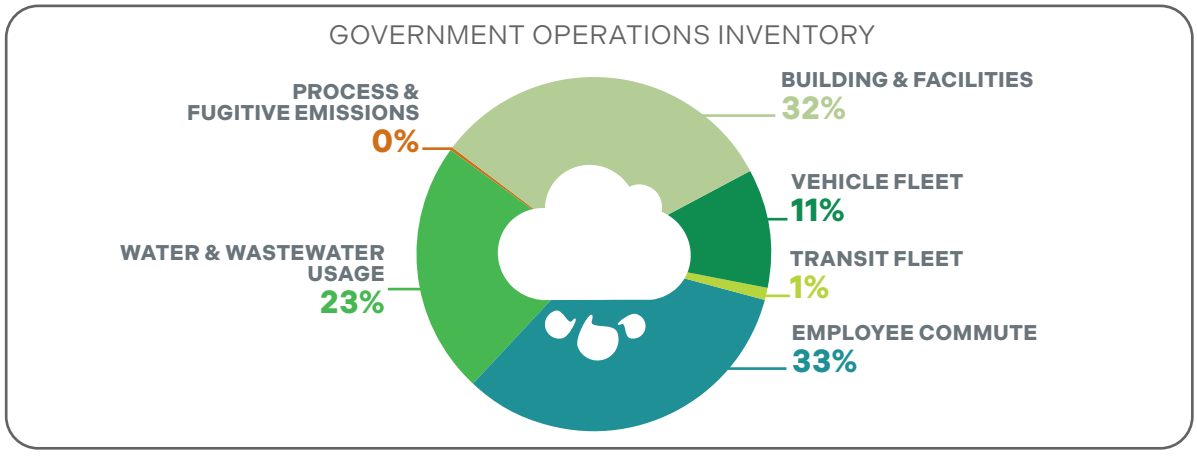


Fig 2: Orange County 2019 government operations emissions by sector

Introductory Summary

This inventory was performed using the U.S. Community Protocol Version 1.2, as developed by ICLEI and updated for this specific GHG accounting exercise in July 2019. Inventory emissions were calculated using best practices and were based on 2019 data gathered from the County. These "usage" data were assigned an appropriate emission factor to arrive at a figure for emissions emitted. The calculations took place within the ICLEI ClearPath tool. ClearPath assists in GHG accounting and management at the community and municipal levels. Emission factors were compiled from 2019 data and information from the federal Environmental Protection Agency GHG Emission Factors Hub,[3] utilized in the ICLEI ClearPath tool.

As a result, this report compiles data from the County and models GHGs to provide an accurate depiction of the County's real-world emissions. It also identifies key areas to focus on for strategy development and program creation to reduce emissions in the County. Finally, it serves as an update to the County's existing GHG inventories completed in 2005 and 2017.[4]

Previous Inventories and Climate Resolutions

For two decades, Orange County has been actively striving to reduce carbon emissions. The County's first GHG inventory was conducted in 2005[5] and the second in 2017. The present inventory, therefore, builds upon previous work to provide useful data on how the County is progressing towards reducing carbon emissions.

On June 6, 2017, Orange County Board of County Commissioners adopted a resolution to uphold the Paris Climate Agreement, committing to reduce GHG emissions between 26 and 28 percent by 2025 from 2005 levels and on September 5, 2017, the Board made an additional commitment to transition to a 100% renewable energy-oriented economy by 2050. These resolutions demonstrate the County's leadership towards climate action by creating informed decisions based on data contained in GHG inventories.

Several important comparisons can be made across sectors between 2005, 2017 and today, despite the fact that not all sectors were consistently measured over the years. Specifically, comparisons can be drawn between residential, commercial, and industrial energy, transportation, and solid waste. As shown in figure 3, these sectors have experienced significant emission reductions since 2005. In 2005, Orange County was responsible for emissions amounting to 2.8 million tons of carbon dioxide equivalent. In 2017 emissions in Orange County had fallen to 1.78 million tons of CO2e. By 2019, emissions fell further, to 1.63 million tons of CO2e, a decrease of 40.7% between 2005 and 2019.

[3] https://www.epa.gov/climateleadership/ghg-emission-factors-hub

[4] https://www.orangecountync.gov/DocumentCenter/View/10049/Orange-County-Greenhouse-Gas-Inventory-2017

[5] https://www.orangecountync.gov/DocumentCenter/View/2002/Greenhouse-Gas-Emissions-Inventory-and-Forecast-PDF

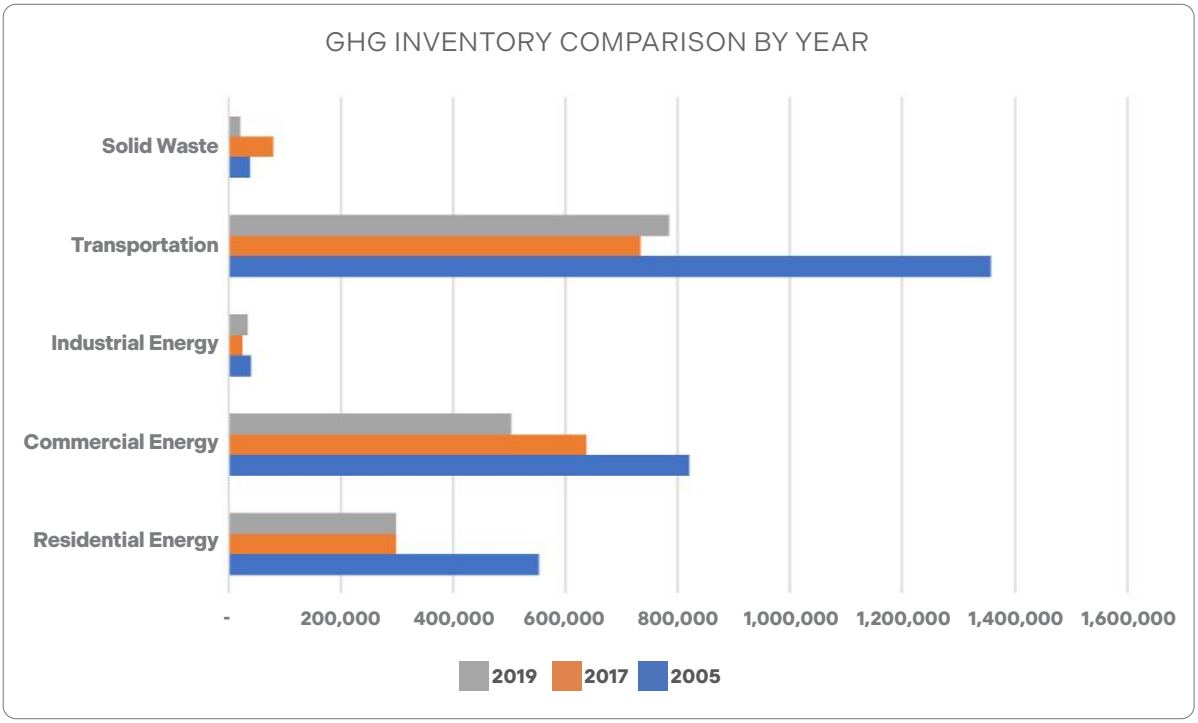


Fig 3: GHG Inventory Comparison by Year

Methodology

The methodology for this inventory was based upon best practices from the US Community Protocol provided by the ICLEI ClearPath tool, coupled with the United States Environmental Protection Agency GHG Emission Factors, which serve as the benchmark for greenhouse gas inventory analysis nationwide. Emissions estimates incorporate real-world usage data (listed in Appendix A), which were subsequently processed through ICLEI ClearPath functions.[6]

INVENTORY YEAR

The year 2019 was selected for this inventory because it offers a more typical representation of GHG emissions for the year 2023 since the COVID-19 pandemic significantly reduced travel emissions and markedly impacted other sectors as well. Notably, the years 2020, 2021, and 2022 recorded significantly lower emissions compared to current levels. Additionally, the Science Based Targets Initiative recommends using 2019 as a baseline year for future emission reduction targets.[7]

COMMUNITY AND COUNTY OPERATIONS INVENTORIES

The inventory considers two distinct greenhouse gas accounting tracks: community and County operations. The community inventory includes emissions from residents within Orange County's jurisdiction, accounting for both emissions from residents within the

[6] https://icleiusa.org/clearpath

[7] https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/11/SBTs-for-cities-guide-nov-2020.pdf

County's limits and from people who recreate and work in Orange County; the community inventory is inclusive of all towns within the County. Required sectors for community GHG inventories are: 1) community building energy use from kilowatt hours and natural gas therms usage, and other significant energy sources 2) transportation emissions from vehicle miles traveled in the county, 3) solid waste disposed, 4) wastewater and water electricity used and gallons consumed. In contrast, the County operations inventory encompasses emissions resulting from Orange County operations and facilities, making it a subset of the community inventory. Although county emissions represent a small fraction of the emissions inventory, managing them is significant, given the government's ability to influence and lead by example to combat climate change. The county operations inventory includes emissions from county buildings, county vehicle fleets, employee commutes, and water consumption.[8]

CALCULATING EMISSIONS

GREENHOUSE GASSES

Local governments are expected to evaluate emissions of the six internationally recognized greenhouse gasses (GHG) under the Kyoto Protocol,[9] namely Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur hexafluoride (SF6). Each of these greenhouse gasses is reported and converted into metric tons (MT), differentiated by their respective Global Warming Potential (GWP). The GWP of each is benchmarked on Carbon dioxide's potential, which is set at 1, as it serves as the reference point for the other gasses. Methane, with a GWP of 28, is largely emitted from landfills, wastewater, and natural gas leakage. Nitrous Oxide, with a higher GWP of 265, is primarily associated with energy production and wastewater treatment. Hydrofluorocarbons, having a wide GWP range of 12-11,700, are mainly tied to refrigerant usage. Perfluorocarbons, with a GWP between 6,500-9,200, typically result from manufacturing and production processes. Sulfur Hexafluoride, possessing the highest GWP of 23,900, is principally connected with power transmission and distribution. This inventory primarily uses Carbon, Methane, and Nitrous Oxide[10] to establish the carbon dioxide emission equivalents (CO2e) for all sectors analyzed.[11]

SECTOR ACTIVITY DATA AND EMISSIONS FACTORS

The process of calculating Carbon dioxide equivalents (CO2e) utilizes both activity data and emission factors. When activity data is multiplied by corresponding emission factors, the result is an amount of carbon dioxide-equivalent emissions. By converting each sector's activity data into carbon dioxide equivalents, a comparative ratio for each sector can be established, enabling further analysis and facilitating decision-making about potential reduction strategies.

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[8] Data was not available for solid waste from County Operations to be differentiated from community waste, therefore all solid waste emissions are included only in the community inventory.

[9] https://unfccc.int/resource/docs/convkp/kpeng.pdf

[10] As referenced in the US Community Protocol the high GWP GHG's perfluorocarbons and sulfur hexafluoride are not required to complete an accurate inventory. The County reported no refrigerant loss, and therefore hydrofluorocarbons do not appear in the inventory. All other GHGs are measured and reported.

[11] https://icleiusa.org/ghg-protocols

EMISSIONS REPORTING

Emissions are quantified using the measure of Carbon dioxide equivalent (CO2e) and compared across sectors. Each sector is individually reported and assessed in relation to others, offering a comprehensive picture of emissions across the County. The community inventory covers building energy use, transportation, solid waste, wastewater, and water. Building energy is further divided into commercial, residential, and industrial use and consists of both electricity and natural gas consumption. The municipal inventory includes building energy use, employee commute, vehicle fleet, water, and wastewater.

Results

The following sections detail the findings from the community and county government operation greenhouse gas inventories, with results organized by sectors. The community and county operations inventories are separate endeavors, but the information is combined within this report. There will be slight overlap in emissions data for the two inventories, and each inventory should be considered as a benchmark for future emission reductions. Calculation methodologies for all results are provided in Appendix B.

Community Inventory

In Orange County, total community emissions were 1,631,671 MT CO2e. This result includes emissions from the combustion of fuel for transportation and mobile services, onsite burning of natural gas in commercial, residential, and industrial structures, emissions linked to electricity procurement for commercial, residential, and industrial edifices, emissions connected to water and wastewater services within the County, as well as solid waste emissions emanating from the County.

TABLE 1: ORANGE COUNTY COMMUNITY INVENTORY BY SECTOR

Sector	MT CO2e	Percentage (%)
Transportation & Mobile Sources	702,701	43%
Commercial Energy	556,800	34%
Residential Energy	299,216	19%
Industrial Energy	33,626	2%
Solid Waste	21,350	1%
Water & Wastewater	12,585	1%
Process & Fugitive Emissions	5,393	0.33%
Total	1,631,671	

COMMERCIAL ENERGY

Commercial energy is the largest emitter of the three classes of energy emissions (the others being residential and industrial), producing 556,800 MT CO2e. Data on commercial electricity energy consumption were provided by Piedmont Electric Cooperative, extrapolated from 2017 data from Duke Energy, and obtained from the cogeneration plants at the University of North Carolina Chapel Hill. Data for natural gas usage were sourced from Dominion Energy.

Of the commercial total, electricity accounted for 258,454 MT CO2e, natural gas contributed 79,263 MT CO2e, and coal-powered cogeneration accounted for 219,083 MT CO2e. Thus, commercial energy constitutes 34% of total community emissions in Orange County.

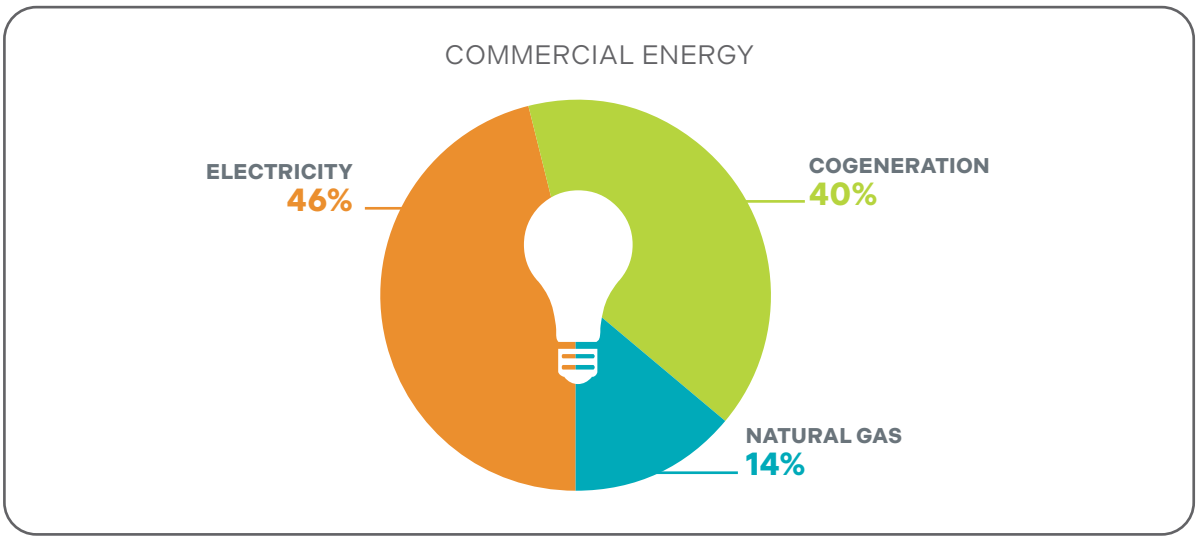

Figure 5. Commercial Energy Breakdown

RESIDENTIAL ENERGY

Residential energy consumption incorporates emissions from natural gas combustion, electricity production, the burning of Liquid Petroleum Gas (LPG), and the use of distillate fuel oil No. 2, all specific to residential communities within Orange County. Data regarding Orange County's residential electricity usage were supplied by Piedmont Electric Cooperative and Duke Energy, while Dominion Energy provided data for natural gas. Statewide data served as the source for LPG and oil No. 2 usage - Orange County's proportionate share was established based on population demographics. Electricity data for 2019 from Duke Electricity were extrapolated from 2017 usage statistics.

Overall residential energy use contributed 299,216 MT CO2e. Of that total, emissions attributed to electricity was 200,750 MT CO2e, natural gas contributed 70,445 MT CO2e, LPG resulted in 26,538 MT CO2e, and distillate fuel oil no. 2 generated 1,483 MT CO2e. Residential energy constituted 19% of total community emissions.

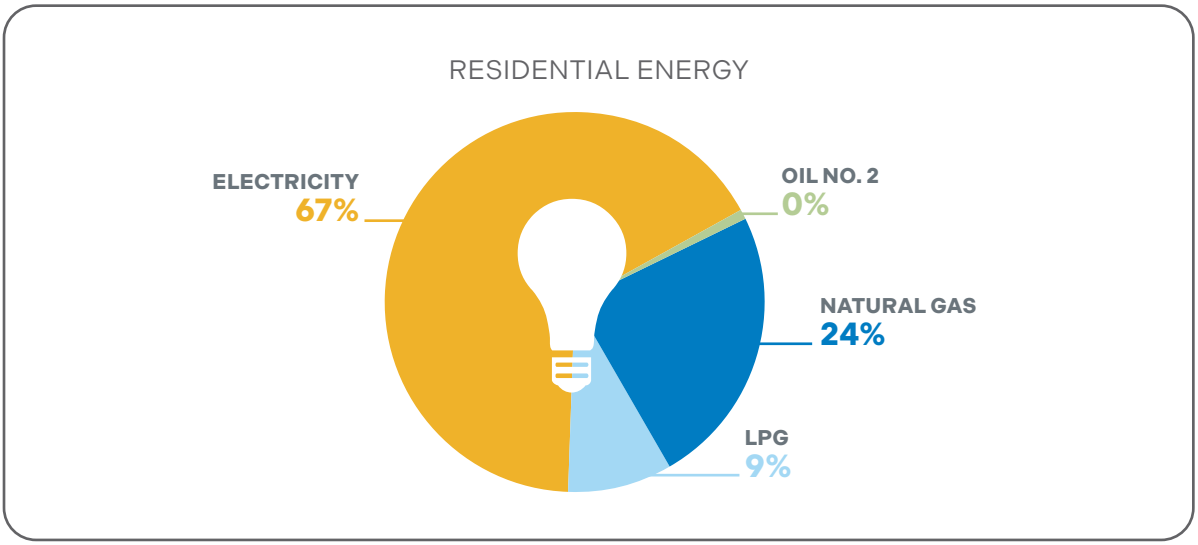

Figure 4. Residential Energy Breakdown

INDUSTRIAL ENERGY

Industrial Energy data were supplied by two entities: Dominion Electric for natural gas and Duke Energy for electricity. The cumulative emissions from industrial energy amounted to 33,626 MT CO2e. Industrial electricity accounted for 18,024 MT CO2e, making up 53% of all emissions from industrial energy. Emissions originating from the combustion of natural gas totaled 15,602 MT CO2e, contributing to 46% of overall industrial energy emissions. Industrial energy usage comprises 2% of the total community emissions in Orange County.

TRANSPORTATION AND MOBILE SERVICE

Transportation and Mobile services are the primary contributor of emissions in Orange County, generating 702,701 MT CO2e and accounting for 43% of the County's total emissions. Orange County is characterized by its widespread rural communities, where reliance on cars is significant, leading to a considerable amount of Vehicle Miles Traveled (VMT) within the County. The emissions produced by gasoline fuel vehicles is 513,127 MT CO2e, while the emissions produced from diesel vehicles equaled 189,575 MT CO2e.

SOLID WASTE

Emissions resulting from the waste sector are derived from estimated methane production due to decomposition of solid waste generated in the County. These calculations incorporate data gathered from the landfill and consider factors such as methane capture processes. Solid waste disposal contributes to 1% of the total emissions in Orange County, accounting for 21,350 MT CO2e.[12] In 2013, the County landfill, Orange County Regional Landfill in Chapel Hill, was closed. All subsequent solid waste has been disposed outside of the county. The methane that is still produced at the County's retired landfill is being destroyed through a partnership with the University of North Carolina, Chapel Hill and the County. Data received from Universities Sustainability Office states that the following totals of CO2e have been destroyed during fiscal years 2020 and 2021: 25,000 MTCO2e (2020) and 22,000 MTCO2e (2021). These amounts generally correspond to the EPA[13] and estimations from ClearPath calculations of landfill gas emitted for the same fiscal years: 23,940 MTCO2e (Calendar year 2020) and 18,490 MTCO2e (Calendar year 2021).

WATER AND WASTEWATER

The Orange Water and Sewer Authority (OWASA) manages some of the County's potable water supply and wastewater disposal and supplied all related data. Total emissions from water and wastewater amount to 12,585 MT CO2e, accounting for 1% of total emissions across the County. Electricity emissions from potable water processes in Orange County are 1,763 MT CO2e. Wastewater electricity consumption is 2,446 MT CO2e and natural gas usage is 196 MT CO2e MT CO2e. Emissions from digester gas consumed equal 5 MT CO2e. Digester gas flaring emitted 68 MT CO2e. Nitrogen discharge from water treatment emitted 103 MT CO2e. Specific to the community inventory are emissions related to household septic systems which produced 8,004 MT CO2e.

PROCESSES AND FUGITIVE EMISSIONS

Fugitive emissions, which are defined as unintended leaks or releases of gasses during the transportation or handling of substances like natural gas, contribute less than one percent to the total emissions of the County, amounting to an equivalent of 5,393 MT CO2e. These inadvertent emissions can occur at various stages of production, processing, storage, transmission, and distribution.

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[12] Waste management and landfill operations in Orange County were undergoing changes during recent years, the information used is extrapolated from 2017 data.

[13] https://ghgdata.epa.gov/ghgp/service/facilityDetail/2021?id=1005524&ds=E&et=&popup=true

County Operations Inventory

The following sections provide detailed insights into the municipal GHG emissions within Orange County. The County's emitting sectors include buildings and facilities, vehicle fleets, transit fleets, and employee commuting. In 2019, the County's municipal activities generated a total of 19,359 MT CO2e, making up roughly 1% of the County's total emissions.

TABLE 2: ORANGE COUNTY'S COUNTY OPERATIONS INVENTORY BY SECTOR

Sector	MT CO2e	Percentage (%)
Buildings & Facilities	6,185	32%
Vehicle Fleet	2,106	11%
Transit Fleet	251	1%
Water and Wastewater	4,479	23%
Employee Commute	6,329	33%
Processes and Fugitive Emissions	9	0.05%
Total	19,359	

BUILDING AND FACILITIES

Orange County's government-owned and operated buildings and facilities contribute 32% of the total emissions in the Municipal Inventory, and total 6,185 MT CO2e. The generation and consumption of electricity, along with the combustion of natural gas, are the primary sources of these emissions. Electricity usage for the government consumed 4,510 MT CO2e, where the natural gas combustion consumed 1,675 MT CO2e.[14]

VEHICLE AND TRANSIT FLEET

The County's vehicle fleet (i.e., county maintenance, county law enforcement vehicles, etc.) represents 11% of total emissions, producing 2,106 MT CO2e. Further, since the County contributes funds towards the operation of transit vehicles (buses, vans, etc.), a portion of those emissions are also included. The County's share of the transit fleet produced 251 MT CO2e.

[14] The County does not have any streetlights under its jurisdiction, which are included at the community inventory level.

EMPLOYEE COMMUTE

A survey of commuting habits was disseminated among all Orange County employees to gauge the carbon impact of the daily commute by the County's workforce. Based on the surveys, employee commuting is estimated at around 33% of the total emissions generated by local government operations, producing 6,329 MT CO2e.

WATER AND WASTEWATER

Emissions associated with water and wastewater contribute to 23% of municipal emissions, as these services are managed and operated by government-owned programs. Electricity emissions from potable water processes in Orange County are 1,763 MT CO2e. Wastewater electricity consumption consumed 2,447 MT CO2e. Wastewater natural gas consumed 196 MT CO2e. Emissions from digester gas consumed equal 5 MT CO2e. Digester gas flaring emitted 68 MT CO2e. Nitrogen discharge from water treatment emitted 103 MT CO2e. Total emissions from government related water and wastewater processes is 4,479.[15]

PROCESSES AND FUGITIVE EMISSIONS

Fugitive emissions account for less than 1% of the total emissions in the municipal inventory of Orange County and are estimated at 9 MT CO2e.

Conclusion

In 2019, Orange County, North Carolina, the community generated a total of 1,631,671 MT C02e and County government operations produced 19,359 MT CO2e. The most significant contributors were transportation and mobile sources, accounting for 43% of community emissions. Commercial energy sources, including electricity, natural gas, and UNC-CH Cogeneration Coal Boilers, were the second highest contributor, constituting 34% of the emissions. Residential energy was the third highest contributor; other sources contributed relatively minor amounts in comparison. As for the emissions attributable to Orange County's government operations, three primary areas were prominent: Employee commute, Buildings and Facilities and Water and Wastewater are responsible for 33%, 32%, and 23% of the total emissions, respectively. Moving forward, Orange County is committed to maintaining its leadership role in North Carolina's efforts to reduce greenhouse gas emissions.

[15] This is not considered double counting emissions according to ICLEI protocols, since these are two separate inventories. In other sectors, municipal data is included in the community inventory in a less explicit way. For example, all County's municipal facilities electricity is included in the community's commercial electricity.

Appendix A.1: Attached Use Data

COMMUNITY INVENTORY

Activity	Unit	Data	Source
Duke Residential Electricity	kWh	477,946,069	Duke Energy 2017.
Piedmont Residential Electricity	kWh	173,705,809	Piedmont Electric Cooperative 2019.
Dominion Residential Natural Gas	MMBtu	1,324,493	Dominion Energy 2019.
LPG Usage	MMBtu	417,443	Orange County U.S. Census, and Energy Information Administration (EIA) 2019.
Distillate fuel oil #2	MMBtu	19,925	Orange County U.S. Census, and Energy Information Administration (EIA) 2019.
Dominion Commercial Natural Gas	MMBtu	1,490,289	Dominion Energy 2019.
Duke Commercial Electricity	kWh	793,824,045	Duke Energy 2017
Piedmont Educational Electricity	kWh	9,947,766	Piedmont Electric Cooperative 2019.
Piedmont Commercial Electricity	kWh	35,193,563	Piedmont Electric Cooperative 2019.
UNC-CH Boiler #6 Coal MMBTU	MMBtu	848,000	2018 Annual Air Emissions Inventory Cogeneration Facility
UNC-CH Boiler #7 Coal MMBTU	MMBtu	913,000	2018 Annual Air Emissions Inventory Cogeneration Facility

COMMUNITY INVENTORY CONTINUED

Activity	Unit	Data	Source
Diesel Transportation	VMT	128,745,750	Google Environmental Insights Explorer (EIE) 2019.
Gasoline Transportation	VMT	1,243,103,837	Google Environmental Insights Explorer (EIE) 2019.
Solid Waste	Tons	53,150	2017 GHG Inventory
Potable Water Electricity	kWh	5,722,491	2019 Orange Water And Sewer Authority (OWASA)
Gas combustion	scf/day	108,960	2019 Orange Water And Sewer Authority (OWASA)
Wastewater Electricity	kWh	7,939,258	2019 Orange Water And Sewer Authority (OWASA)
Wastewater Natural Gas	Therms	36,890	2019 Orange Water And Sewer Authority (OWASA)
Flaring of Digester Gas	Cubic ft/day	54,480	2019 Orange Water And Sewer Authority (OWASA)
Septic Systems Emissions	Population	65,884	2019 Orange County U.S. Census Data
Daily Nitrogen discharge	kg N/day	135	2019 Orange Water And Sewer Authority (OWASA)

COUNTY OPERATIONS INVENTORY DATA

Activity	Unit	Data	Source
Building and Facilities	MWH	14,639	2019 Orange County Usage
	Therms	315,060	2019 Orange County Usage
Vehicle Fleet	Gallons	238,996	2019 Orange County Usage
Transit Fleet	Gallons	28,595	2019 Orange County Usage
Employee Commute	Miles	17,443,305	2019 Orange County Commute Survey
Wastewater Electricity	kWh	7,939,258	2019 Orange Water And Sewer Authority (OWASA)
Digester Gas Combustion	scf/day	108,960	2019 Orange Water And Sewer Authority (OWASA)
Digester Gas Flaring	cubic feet/day	54,480	2019 Orange Water And Sewer Authority (OWASA)
Wastewater Natural Gas	Therms	36,890	2019 Orange Water And Sewer Authority (OWASA)
Potable Water Electricity	kWh	5,722,491	2019 Orange Water And Sewer Authority (OWASA)

Appendix A.2: Detailed Methodology

COMMUNITY INVENTORY

ELECTRICITY

Residential, commercial, and industrial electricity usage data for 2019 were furnished by Duke Energy and Piedmont. The process of determining emissions involved multiplying electricity usage by the emissions factor relevant to the jurisdiction where the electricity was generated. ICLEI: Local Governments for Sustainability[16] provided emission factors for local jurisdictions, which is based on data from the EPA Emissions Hub for SERC Virginia/Carolina (SRVC) eGRID 2019. The specific emission factors are as follows: the CO2 emission factor is 0.089765 MT/MMBtu, the CH4 emission factor is 7.7084 x 10^{-6} MT/MMBtu, and the N2O emission factor is 1.0632 x 10^{-6} MT/MMBtu. When these are added to carbon emissions the result is CO2e which represents the total Global Warming Potential.

Duke Energy's recent billing modifications resulted in the loss of certain emission data for 2019. This prompted us to estimate emissions using the growth rate of Orange County from 2010-2020 using census data. The County experienced an average annual growth rate of 1.1%, which we used as the basis for our electricity usage estimations. For example, in 2017, residential electricity usage from Duke amounted to 467,602,240 kWh. After applying the growth factor, we estimated that Duke's residential electricity for 2019 would be around 477,946,069 kWh. We used the same method to estimate commercial electricity usage growth from 776,643,905 kWh to 793,824,044.8 kWh. We also estimated that Duke's industrial energy usage would rise from 57,245,643 kWh to 58,511,973.87 kWh.

NATURAL GAS

Data on residential and commercial natural gas was provided by Dominion Energy. The calculation of natural gas emissions involves multiplying the usage data by an emission factor provided by the US Community Protocol BE.1.1.[17] The respective emission factors are 53.02 kg/MMBtu CO2, 0.005 kg/MMBtu for CH4, and 1 xE-4 for N2O. The full methodology is detailed in the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix C: Built Environment Emission Activities and Sources.

LPG AND DISTILLATE FUEL OIL NO.2

These categories are calculated using data from the United States Census Bureau information[18] and methodologies from the US Community Protocol.[19] The Census Bureau tracks statewide residential non-utility fuel usage. To determine the proportion of fuel usage in Orange County, we compared the number of households in the County using each type of fuel to the total number of households in the entire state using the same fuel

[16] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix C: Built Environment Emission Activities and Sources.

[17] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix C: Built Environment Emission Activities and Sources

[18] https://data.census.gov

[19] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix C: Built Environment Emission Activities and Sources

type. In Orange County, 6,078 households use bottled, tank, or LP gas, and 445 use fuel oil, kerosene, or similar fuels. Statewide, 256,257 households use bottled, tank, or LP gas, and 91,569 use fuel oil, kerosene, etc. The proportion of households in Orange County using bottled, tank, or LP gas is 0.0237, while the proportion using fuel oil, kerosene, etc., is 0.0486. To calculate the County's share of energy consumption, we multiply these proportions by the statewide energy use. According to data from the US Energy Information Administration,[20] North Carolina consumes 17.6 trillion Btu of Hydrocarbon Gas Liquids (HGL, which includes LPG) and 4.1 trillion Btu of Distillate Fuel Oil. After converting these figures from trillion Btu to MMBtu and applying Orange County's proportions, we estimate that the County's consumption of LPG is 417,443 MMBtu and its consumption of Distillate Fuel Oil #2 is 19,925 MMBtu. These estimates are calculated to carbon equivalencies using the US Community Protocol in ICLEI, applying emission factors of 62.98 kg/MMBtu for CO2, 0.01087 kg/MMBtu for CH4, and 0.0010870 kg/MMBtu for N2O.

COAL

Emissions data from the coal cogeneration boilers at the University of North Carolina at Chapel Hill are sourced from the 2018 Annual Air Emissions Inventory Cogeneration Facility report, prepared by ClimeCo Corporation in 2019.[21] Detailed information about emissions from Boiler 6 can be found on pages 31-33, while Boiler 7's emissions are documented on pages 54-56.

TRANSPORTATION AND MOBILE SERVICE

Transportation emissions in Orange County were computed using the Google EIE transportation data,[22] a source recommended by ICLEI. The emissions factors are sourced from the US Community Protocol,[23] which are as follows:

CO2 Emissions Factor	0.07024
CO2 Emissions Factor Units	MT/MMBtu
CH4 Emissions Factor	1.9493×10^{-8}
CH4 Emissions Factor Units	MT/mile
N2O Emissions Factor	1.0608×10^{-8}
N2O Emissions Factor Units	MT/mile

[20] https://www.eia.gov/state/search

[21] 2018 Annual Air Emissions Inventory Cogeneration Facility. The University of North Carolina at Chapel Hill: Chapel Hill, North Carolina

[22] https://insights.sustainability.google/places/ChIJEejT22XdrIkRPupCdcVJt0k?hl=en-US

[23] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix D: Transportation and Other Mobile Emission Activities and Sources

SOLID WASTE

Due to the existence of five waste haulers in the County and the closure of the local landfill in 2013, tracking the amount of solid waste produced in Orange County proved challenging. The destination landfill was unable to provide the required data in time for this report, necessitating an estimation of total solid waste based on 2017 levels and a growth factor for two subsequent years. Emission factors were determined using the 2019 Orange County Recyclables Characterization Study[24] and the 2017 Waste Characterization study[25] conducted by Kessler Consulting. The following are the specific emission factors: Mixed MSW Emission Factor (MT CH4/wet short ton) 0.0648, Newspaper Emission Factor (MT CH4/wet short ton) 0.042, Office Paper Emission Factor (MT CH4/wet short ton) 0.1556, Corrugated Cardboard Emission Factor (MT CH4/wet short ton) 0.1048, Magazines/Third Class Mail Emission Factor (MT CH4/wet short ton) 0.0476, Food Scraps Emission Factor (MT CH4/wet short ton) 0.0648, Grass Emission Factor (MT CH4/wet short ton) 0.0228, Leaves Emission Factor (MT CH4/wet short ton) 0.026, Branches Emission Factor (MT CH4/wet short ton) 0.058. The calculation methodology was adopted from the US Community Protocol.[26]

WATER AND WASTEWATER

Both potable water and wastewater systems consume electricity, and the emissions from this are calculated as previously outlined. Additionally, wastewater treatment processes utilize natural gas, the emissions from which are calculated using the aforementioned methods. The process of digester gas combustion is estimated using site-specific data obtained from OWASA. This information is converted into emissions data by applying emission factors from the US Community Protocols. Specifically, the Biogenic CO2 Emissions Factor is 52.07 kg/MMBtu, the CH4 Emissions Factor is 0.0032 kg/MMBtu, and the N2O Emissions Factor is 6.3 x 10-4 kg/MMBtu. Further details on digester combustion calculations can be found in US Community Protocols WW.1.A, WW2.A, and WW.3. Emissions resulting from the flaring of digester gas are also considered in this inventory. This is determined using site-specific data sourced from OWASA and adhering to the best calculation practices provided by the US Community Protocol. The CH4 Emissions Factor in this case is 1.2177 x10-7 MT CH4/scf. Daily nitrogen discharge is another factor incorporated in this inventory. Using the daily nitrogen load provided by OWASA, emissions data is calculated in line with the US Community Protocol. Here, the N2O Emissions Factor stands at 0.005 kg N2O/kg N in effluent. Additional details concerning effluent discharge can be referenced in the US Community Protocol, specifically WW.12. The final aspect of the water and wastewater analysis pertains to emissions from septic systems. While OWASA services the majority of households in

[24] ORANGE COUNTY, NORTH CAROLINA RECYCLABLES CHARACTERIZATION STUDY, Kessler Consulting, Inc.

[25] https://www.orangecountync.gov/DocumentCenter/View/2826/2017-Orange-County-Waste-Characterization-Study-Final-Report-PDF

[26] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix E: Solid Waste Emission Activities and Sources

Orange County, approximately 65,000 are not covered by the local wastewater agency. This results in widespread use of septic systems for wastewater disposal. Emissions from these systems can be calculated using a population-based method, which incorporates a CH4 Emissions Factor of 0.048213 MT CH4 per daily kg BOD5. An alternative calculation approach is documented in the US Community Protocol under reference WW.11 (alt).[27]

FUGITIVE EMISSIONS

Fugitive emissions were calculated by usage data summed from natural gas. This was multiplied by a leakage factor of an industry standard recommended by the U.S. Community Protocol.[28] The leakage emissions are multiplied by an emissions factor of 6.1939×10^{-5} MT CH4/MMBtu natural gas used, and CO2 emission factor of 6.6316×10^{-5} MT CO2/MMBtu natural gas used.

COUNTY OPERATIONS INVENTORY

BUILDING AND FACILITIES

Orange County's buildings and facilities emissions were calculated using usage data obtained from the government's tracking software. This software monitors both electricity and natural gas usage data. The calculations were carried out in the same manner as those for the community inventory of natural gas and electricity.

VEHICLE FLEET

Fuel usage for Orange County's vehicle fleet was supplied by the County and calculated using the US Community Protocol.[29] The annual miles traveled, and annual fuel usage are tracked and multiplied by emission factors from ICLEI. These include a CO2 Emissions Factor of 0.070268 MT/MMBtu, a Biogenic CO2 Emissions Factor of 0 MT/MMBtu, a CH4 Emissions Factor of 2.153 x10-8 MT/vehicle mile, a Biofuel CH4 Emissions Factor of 0 MT/vehicle mile, a N2O Emissions Factor of 1.248 x10-8 MT/vehicle mile, and a Biofuel N2O Emissions Factor of 0 MT/vehicle mile.

TRANSIT FLEET

Data on Orange County's transit fleet usage was also provided by the County. This data was broken down by vehicle types, with transit fleet vehicles identified as buses within the data sheet. Emission factors for transit fleet buses include a CO2 Emissions Factor of 0.07024 MT/MMBtu, a CH4 Emissions Factor of 1.93 x 10-8 MT/vehicle mile, and a N2O Emissions Factor of 1.48 x10-8 MT/vehicle mile.[30]

[28] https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

[29] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix D: Transportation and Other Mobile Emission Activities and Sources

[30] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix D: Transportation and Other Mobile Emission Activities and Sources

EMPLOYEE COMMUTE

Data on employee commutes was provided by the 2019 commuting survey of Orange County employees. This survey asked employees about their commuting habits, and total annual Vehicle Miles Traveled (VMT) was extrapolated from the responses. While the survey results did not include total mileage, it was possible to calculate this by multiplying the average miles per commute by the average workdays per week and then calculating the yearly VMT using the average number of working weeks in a year, which is 49.[31] This yields the total annual commuting VMT for Orange County. The emissions were then calculated using the US Community Protocol emission factors of CO2 Emissions Factor 0.07024 MT/MMBtu, CH4 Emissions Factor 1.8300 x10-8 MT/Mile, and a N2O Emissions Factor 8.3 x10-9 MT/Mile.

WATER AND WASTEWATER

The emissions from water and wastewater operations for Orange County's municipal activities were calculated in the same manner as in the community inventory.[32] As OWASA is a municipal operation, its emissions should be included under those from the County. The difference between the two sectors is that the municipal inventory does not include emissions from septic systems.

FUGITIVE EMISSIONS

These are calculated in the same way as the community inventory. Fugitive emissions were calculated by usage data summed from natural gas used by the county operations. Usage was multiplied by a leakage factor of an industry standard recommended by the U.S. Community Protocol. [33] The leakage emissions are multiplied by an emissions factor of 6.1939×10^{-5} MT CH4/MMBtu natural gas used, and CO2 emission factor of 6.6316×10^{-5} MT CO2/MMBtu natural gas used.

[31] https://www.bls.gov/news.release/pdf/atus.pdf

[32] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix F: Wastewater and Water Emission Activities and Sources

[33] https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

Appendix B: Methodology of Emission Forecast

ORANGE COUNTY
NORTH CAROLINA

Summary

This report describes greenhouse gas (GHG) emissions reduction targets and estimated forecasts that are identified in Orange County's 2023 Climate Action Plan (the Plan). It also describes the County's mitigation target plan to the year 2050. The report quantifies the carbon reduction impact that local and federal laws, utility grid mix changes, and transportation efficiencies will have on Orange County's business-as-usual forecast, which results in an "adjusted business-as-usual forecast." Finally, it provides visualizations of the results of Orange County's "Top 10" emission reduction strategies from the Plan.

Provisional targets for Orange County's GHG mitigation efforts are as follows:

1. Achieve 50% emission reduction target by 2030 from a 2005 baseline.

2. Achieve 100% emissions reduction by 2050 from a 2005 baseline

This "forecasting" report focuses on emissions in comparison to the 2005 baseline. In 2005 the total tracked emissions[1] for Orange County were 2,802,500[2] metric tons (MT) of carbon dioxide equivalents (CO2e).[3] In 2017 the GHG inventory was 1,777,667 MT CO2e.[4] The total emissions in 2019 fell to 1,631,671 MT CO2e which represented a reduction of 40.7% in 14 years.[5] Looking forward, a business-as-usual (BAU)[6] forecast for Orange County shows emissions will grow to 1,693,944 MT CO2e by 2030, and to 1,813,315 MT CO2e by 2050, if no further action is taken. The adjusted business-as-usual (ABAU) forecast shows emissions will reduce to 1,311,816 MT CO2e in 2030, and to 947,191 in 2050; this forecast considers the expected effect of several policy measures that are described below. To achieve targets set in the 2023 Climate Action Plan emissions from sectors listed in the 2005 GHG inventory (residential, commercial, and industrial energy, transportation, and solid waste) should not exceed 1,410,250 MT CO2e by the year 2030. To further reach a 100% reduction in emissions would require significant investment in the strategies listed in the Plan, in addition to other actors achieving State and local policy goals (i.e. utility renewable energy targets, vehicle efficiency measures, etc.). If targets from policy goals plus the Top 10 Emission reduction strategies from the 2023 Plan are met, the County's emissions will reduce to 993,646 MT CO2e by 2030 and 56,991 MT CO2e by 2050.

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[1] https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance

[2] https://www.orangecountync.gov/DocumentCenter/View/2002/Greenhouse-Gas-Emissions-Inventory-and-Forecast-PDF

[3] The only sectors surveyed in the 2005 inventory were residential, commercial, and industrial energy, transportation, and solid waste. Further, The GHG inventory associated with this Plan comes from 2019 data.

[4] https://www.orangecountync.gov/DocumentCenter/View/10049/Orange-County-Greenhouse-Gas-Inventory-2017

[5] In 2019 there was tracking of water and wastewater, and fugitive emissions from natural gas processes, which increased total emissions.

[6] The business-as-usual forecast was estimated starting in the year 2019 using projected growth in population, households, employment, and vehicle miles traveled between 2010 and 2020. Projections were obtained from the United States Census Data. Data for the years 2020 and 2050 were estimated using straight-line interpolation from the USA Census.

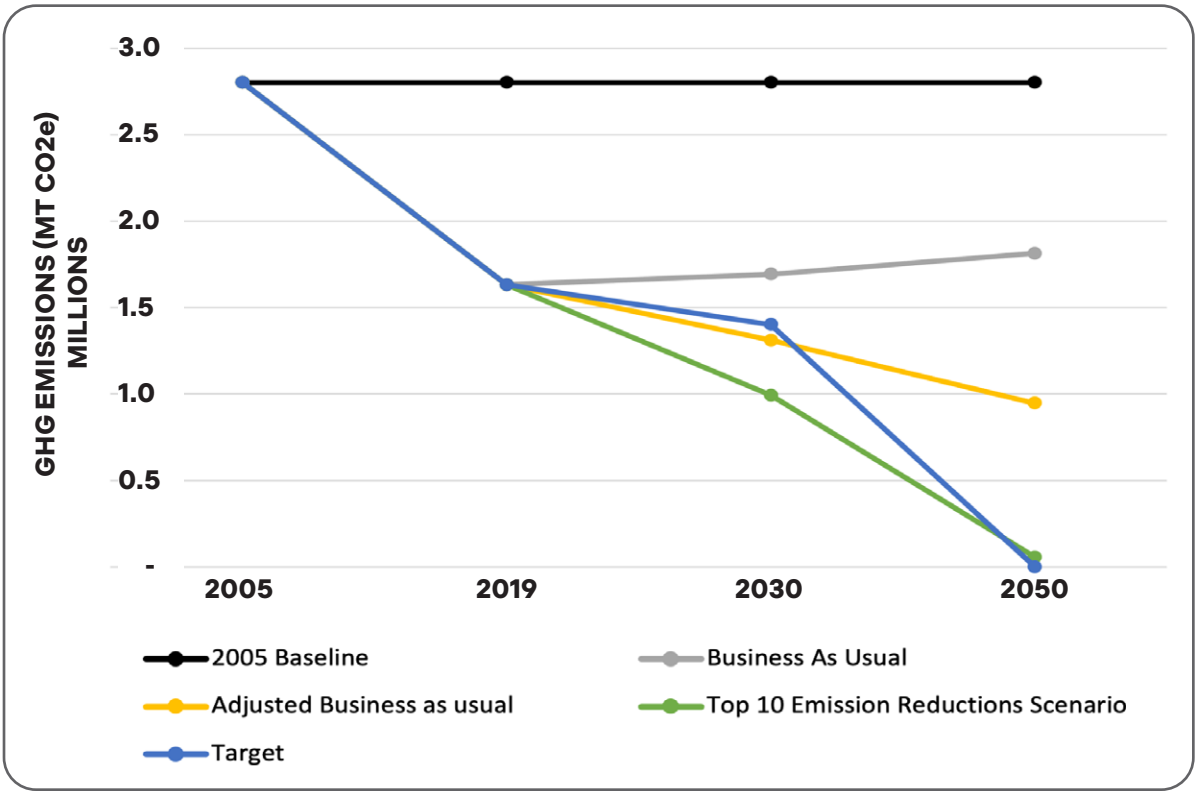

FIGURE 1: SUMMARY OF ORANGE COUNTY'S GHG EMISSIONS AND REDUCTION TARGETS

Background

Orange County has set its goals within the context of a strong commitment for environmental mitigation from state and regional partners. The following describes several of the State, regional, and local policies that precede and form a foundation for the County's Plan.

STATE GUIDANCE

North Carolina Executive Order NO. 80 aligns the State to the 2015 Paris Agreement and the United States Climate Agreement. Further, North Carolina has ratified reduction targets for carbon emissions to 40% from 2005 levels.[7] Executive Order 252[8] builds upon the prior order to reduce GHG emissions by 50 to 52 percent below 2005 levels by 2030.

House Bill 951[9] authorizes utility companies in North Carolina to take necessary steps to reduce carbon emissions by 70% from 2005 levels by the year 2030, and to become carbon neutral in 2050.

[7] https://www.deq.nc.gov/energy-climate/climate-change/nc-climate-change-interagency-council/climate-change-clean-energy-plans-progress

[8] https://governor.nc.gov/executive-order-no-246/open

[9] General Assembly Of North Carolina Session 2021. Session Law 2021-165. House Bill 951

The North Carolina Clean Energy Plan[10] sets a net zero GHG emissions target for 2050 and established goals to support this target by fostering long-term energy affordability and accelerating clean energy innovation, development, and deployment to better serve business and residential communities. To support these goals, the plan states a commitment to develop carbon reduction policies, tools to support the policies, and to modernize the grid in support of clean energy resource adoption.

The Cities Initiative,[11] led by the Environmental Defense Fund, is a collaborative effort among North Carolina local governments to reduce GHG emissions, evaluate barriers, understand business needs, and pursue partnership opportunities. During Phase 1, the Initiative identified 12 core goals around clean energy, transportation, and the built environment on which the collaborative will focus in the coming months. A large part of the process is to uncover funding approaches to support these goals. Phase 2 will unfold in 2024. During this phase, specific strategies and actions will establish a roadmap for implementation.

Triangle Clean Cities Coalition[12] leverages resources from the Department of Energy's Vehicle Technology office to promote alternative fuels and electric vehicle adoption. The coalition provides collaboration, multi-jurisdiction grant opportunities, workshop education and technical assistance to municipalities who are committed to finding sustainable transportation solutions.

Duke Energy company has committed to a 50% reduction in emissions by 2030 and net zero emissions by 2050.[13] Piedmont Energy, another County supplier, also commits to reducing energy by 50% by 2030, and to achieving carbon neutrality by 2050.[14]

REGIONAL GUIDANCE

The Triangle Climate Resilience Partnership[15] is a cooperative partnership among the Towns of Cary and Chapel Hill, the Cities of Durham and Raleigh, and the Counties of Durham and Orange. The Steering Committee is composed of the partners' Sustainability Managers, Sustainability Directors, and Resilience Officers. This partnership—in conjunction with UNC Asheville's National Environmental Modeling and Analysis Center and the Triangle J Council of Governments—performed a quantified assessment to help regional decision makers understand which assets are most vulnerable to specific threats and provide guidance on potential solutions.

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10 "Clean Energy Plan. North Carolina Environmental Quality." Clean Energy Plan | NC DEQ.

11 https://www.deq.nc.gov/energy-climate/climate-change/mitigation/cities-initiative

12 https://cleancities.energy.gov/coalitions/triangle

13 https://www.duke-energy.com/business/products/renewables/sustainability/sustainability-goals#:~:text=We've%20already%20seen%20CO2,your%20higher%20carbon%20energy%20usage.

14 https://pemc.coop/smart_energy/energy-portfolio/#:~:text=Piedmont%20Electric%20pledges%20to%20reduce,providers%20to%20meet%20these%20goals.

15 https://www.tjcog.org/focus-areas-environment-resilience-climate-and-energy/triangle-regional-resilience-partnership

Triangle Sustainability Partnership has successfully initiated the "Solarize the Triangle" program, which hit its top goal of reaching Tier 8 pricing in its first year. It was also successful in lowering the cost of solar for all participants by thirty-seven cents per kilowatt ($0.37/kW), achieving $300,500 in annual utility bill savings, generating $5.98 million in new clean energy development, creating 1,731 kW of new clean energy capacity, and avoiding 3.5 million pounds of carbon dioxide annually. This program will be expanded in 2024 to focus on electrification with a new program entitled "Electrify the Triangle".

Central Pines Regional Council (formerly Triangle J Council of Governments) is a resource and support hub for local governments, community members, and partners across Chatham, Durham, Johnston, Lee, Moore, Orange, and Wake counties. This public private partnership focuses on building networks to address gaps, overcome barriers, and surface funding opportunities in key areas, including Environment & Resilience and Mobility & Transportation.

The Southeast Sustainability Directors Network is another consortium with which Orange County is involved. The Network helps facilitate and advocate for regional climate initiatives, offers peer learning opportunities, equity resources, and information on regional funding.

Provisional GHG Reduction Targets

Blue Strike Environmental recommends the County adopt two GHG mitigation targets, one for 2030 and another for 2050. The targets are similar to those of nearby cities and the State of North Carolina. These goals are fully described in the 2023 Plan, but are summarized as follows:

1. Achieve 50% emission reduction by 2030 from a 2005 baseline.
2. Achieve 100% emissions reduction by 2050 from a 2005 baseline

These goals are consistent with state laws, regional partners, and local organizations regarding GHG mitigation. North Carolina identified a mid-term goal of reducing emissions by 50% by 2030 from a 2005 baseline, and a long-term goal of carbon neutrality by 2050 with Executive Order NO. 80, Executive Order NO. 252 and House Bill 951. By executing the strategies in the 2023 Plan, Orange County will meet these State guidelines.These targets are realistic given the surrounding local, regional, and state commitments, including those of the utilities from which the County draws its power.

TABLE 1: 2020 AND 2035 GHG EMISSIONS TARGETS

2005 Baseline GHG Emissions	2,802,500 MT CO2e
2030 Target (50% below 2005 Levels)	1,401,250 MT CO2e
2050 Target (100% below 2005 Levels)	Carbon Neutrality

GHG Emissions Forecasts

GHG emission forecasts can be used to estimate the effectiveness of the Plan's carbon reduction strategies in reaching the County's goals. Emission forecasts that include the implementation of the strategies, can be compared to forecasts that do not include the strategies, which are called BAU forecasts. A BAU forecast considers factors such as population and employment, projecting emission changes based on expected growth, but without the County taking any mitigation action. An ABAU forecast is similar, but additionally considers relevant, anticipated behaviors of outside actors on the County. A good example is an electricity utility that has committed to reduce emissions from its energy mix; by virtue of their commitment, County emissions would fall due to declining emissions of the electricity used within the County. Finally, to measure the impact of the Plan, the GHG reduction potential of each strategy is subtracted from the BAU and/or ABAU forecasts.

BUSINESS-AS-USUAL FORECAST

The Orange County business-as-usual forecast scenario shows an estimate of how GHG emissions would change between the years 2019 and 2050 if population trends, vehicle efficiencies, and energy usage continue, without further application of regulations that would reduce local emissions. As shown in Figure 2, under the 2019 business-as usual forecast, Orange County's GHG emissions are estimated to grow approximately 10% above 2019 emission levels by the year 2050 (from 1,631,674 MT CO2e to 1,813,315 MT CO2e).[15]

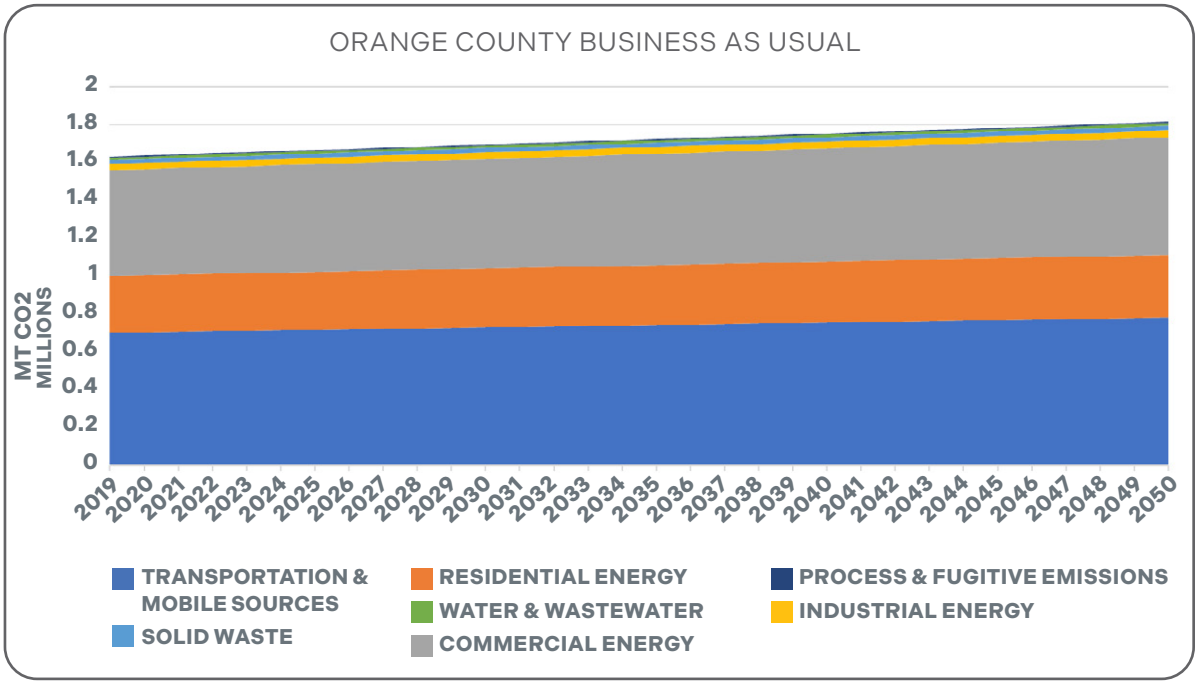

FIGURE 2: BUSINESS-AS-USUAL FORECAST

[15] This forecast was developed in the ICLEI ClearPath program and utilizes baseline annual population growth which is calculated to be approximately 1.1% as according to the US Census Bureau between 2010 and 2020.

ADJUSTED BUSINESS-AS-USUAL FORECAST

There are several federal, state, and local regulations, along with organizational commitments, that have been enacted that would reduce Orange County's GHG emissions. The influence of these regulations and commitments was quantified and included into the ABAU forecast to provide a more complete picture of emissions growth to 2050. This forecast also shows the remainder of emissions the County will need to reduce if it wants to achieve carbon neutrality. As shown in the figure below, state regulations are expected to reduce Orange County's business-as-usual GHG emissions by approximately 319,855 MT CO2e by 2030 and 684,480 MT CO2e by 2050.

North Carolina Executive Order NO. 80 aligns the State to the 2015 Paris Agreement and the United States Climate Agreement. North Carolina ratified targets for reducing carbon emissions 40% from 2005 levels.[16] House Bill 951[17] provides for utility companies in North Carolina to take steps to reduce carbon emissions by 70% from 2005 levels by the year 2030, and further to become carbon neutral by 2050. Duke Energy has committed to a 50% reduction in emissions by 2030, and to net zero emissions by 2050.[18] Piedmont Energy has also committed to reducing energy by 50% by 2030, and to carbon neutrality by 2050.[19] Emission reductions from these commitments move the County towards green energy, with average reductions of 13,742 MT CO2 per year to 2050. The Corporate Average Fuel Economy (CAFE) standards also impact Orange County emissions by reducing the amount of carbon emitted by transportation and vehicle miles traveled. According to ICLEI ClearPath, increasing CAFE standards will reduce emissions by 1.8% per year. Within the County, CAFE standards can reduce emissions by an average of 8,322.6 MT CO2e annually.

[16] https://www.deq.nc.gov/energy-climate/climate-change/nc-climate-change-interagency-council/climate-change-clean-energy-plans-progress

[17] General Assembly Of North Carolina Session 2021. Session Law 2021-165. House Bill 951

[18] https://www.duke-energy.com/business/products/renewables/sustainability/sustainability-goals#:~:text=We've%20already%20seen%20CO2,your%20higher%20carbon%20energy%20usage.

[19] https://pemc.coop/smart_energy/energy-portfolio/#:~:text=Piedmont%20Electric%20pledges%20to%20reduce,providers%20to%20meet%20these%20goals.

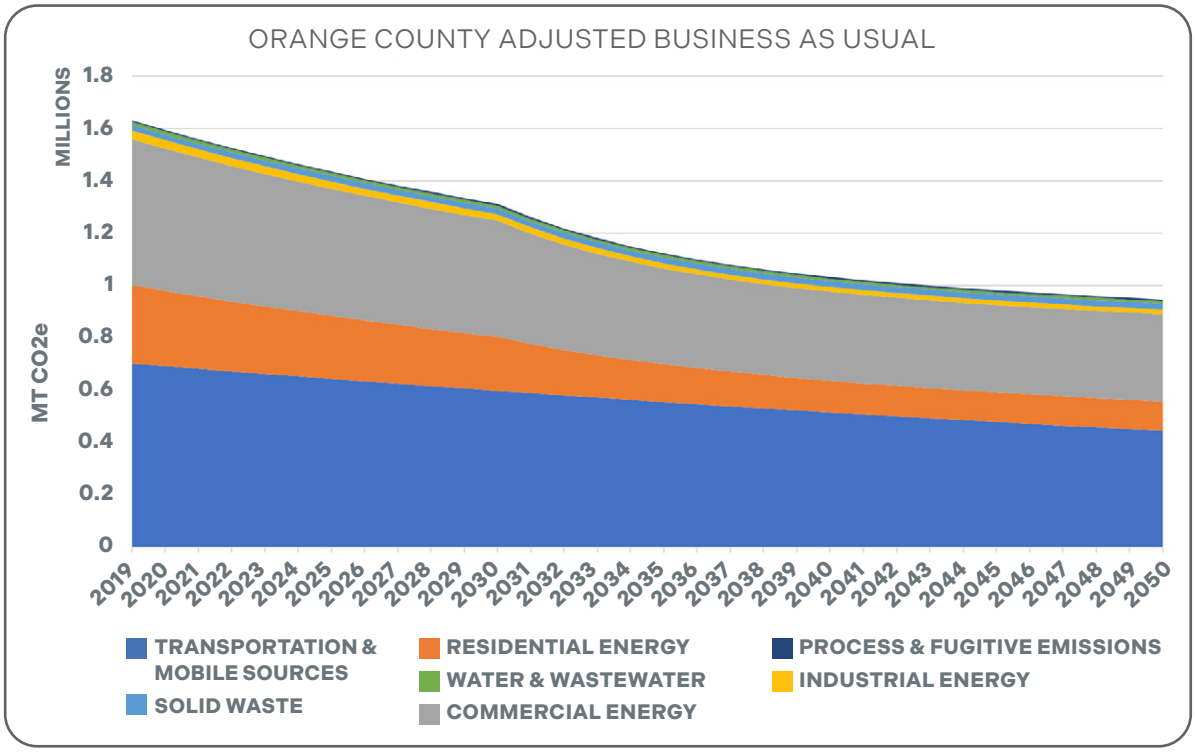

FIGURE 3: ADJUSTED BUSINESS-AS-USUAL FORECAST

TOP 10 EMISSION REDUCTION STRATEGIES

To evaluate the targets set in the 2023 Plan, Blue Strike modeled five of the Top 10 emission reduction strategies– those with associated quantifiable emissions reductions. Table 2 shows the annual emission reductions for each individual strategy. The annual emission reductions were calculated and modeled in the ICLEI ClearPath program.

TABLE 2: EMISSION REDUCTIONS STRATEGIES FROM 2023 CLIMATE ACTION PLAN

Decrease vehicle miles traveled (VMT) 30% from a 2019 baseline by 2050	613 MT CO2e/year
Increase community EV adoption to 50% by 2035 and 100% by 2050	12,828 MT CO2/year
Achieve 50% energy emission reduction target by 2030 and 100% by 2050 using a 2005 baseline	30,871 MT CO2/year
Achieve 100% clean renewable energy by 2050 in municipal and community sectors	912 MT CO2/year
Increase the % of community wide solar by 25% by 2035	439 MT CO2/year

A forecast of emission reductions that includes the strategies is shown in Figure 3. When the strategies are added to the ABAU scenario the County could reduce its 2030 emissions to 993,646 MT CO2 per year, which achieves the target of 50% emission reduction by that year, against a 2005 baseline. By 2050 the County would emit just 56,991 MT CO2 annually, if the strategies are implemented. The remaining emissions are due to solid waste, water, and wastewater treatment. The reduction of these remaining emissions, to fully meet a target of net zero emissions by 2050 is discussed in the 2023 Plan but is not quantified in the forecast.

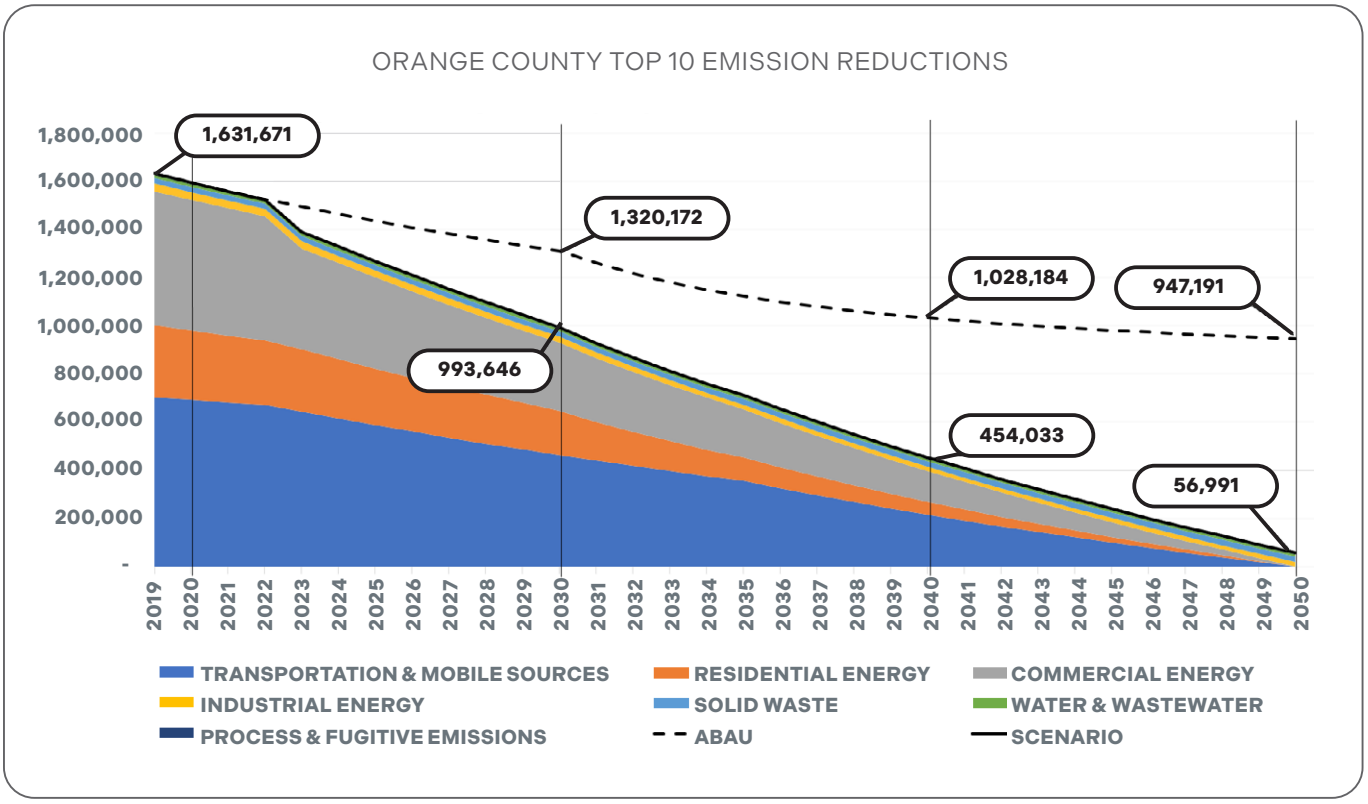

FIGURE 3: Orange County Top 10 Emission Reductions

Meeting the Targets

Achieving emission reductions as substantial as those outlined in the 2023 Climate Action Plan will depend upon fully implementing the strategies of the 2023 Plan. By tracking these strategies, and regularly updating the GHG inventory, the County can look towards achieving its goals with a hope of 50% emissions reductions by 2030 and net zero by 2050.

Appendix C: Stakeholder Report

ORANGE COUNTY
NORTH CAROLINA

Background

The project team established a stakeholder outreach plan in advance of the CAP planning process. The purpose of this plan was to establish a baseline of actions taken by the County that were already underway, identify gaps and barriers for why some actions fell short, and to better understand what the communities' values and goals are in the near, mid and long term time horizon.

Four workshops were conducted over the course of three months. The Agricultural Summit was held in person and the remaining workshops were held on an online platform. This report highlights the feedback received.

Workshops #1 - Farming Community & Climate Impact

Date: February 20, 2023 • 11:00–12:00pm EST
Location: Orange County Agricultural Summit @ Cedar Grove Community Center
Est. Attendance: 40 people

KEY TAKEAWAYS (OPPORTUNITIES):

- Regional knowledge and resources to support carbon sequestration are lacking. Consider engaging in discussions with the water and soil district[1] to explore the possibility of incorporating it into their education and outreach initiatives.
- Breeze Farms serves as an incubator farm and a pilot for various sustainability features, such as agro voltaics, EVSE, and carbon sequestration. This presents a significant opportunity to integrate climate action into conversations and determine the optimal utilization of the land.
- Currently, only two farmer/ranchers have small solar projects on their properties. Investigate Duke's restrictions and find solutions to facilitate bulk purchases.
- Local support is available, with Garland Truffles[2] expressing interest in participating in the planning process.
- There are numerous programs and funding opportunities through NC Cooperative Extension. Explore possibilities for collaboration. The 2030 Comprehensive Plan[3] is being updated by the Planning Department.
- A representative from the Community Land Trust[4] attended the workshop and could serve as a valuable resource for education and outreach initiatives.

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[1] https://www.ocsoilny.org/agricultural-conservation.html

[2] https://garlandtruffles.com/

[3] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.nahb.org/-/media/NAHB/advocacy/docs/top-priorities/housing-affordability/case-study-orange-county-nc.pdf

[4] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.nahb.org/-/media/NAHB/advocacy/docs/top-priorities/housing-affordability/case-study-orange-county-nc.pdf

- Determine the regulations pertaining to property line enhancements, as concerns were raised about the need for additional buffer zones between commercial and residential land units.
- There is limited knowledge regarding agroforestry. Define the potential role it could play in the Climate Action Plan (CAP).
- Agrotourism appears to be a popular topic. Assess the number of participating farms offering these services and establish how locally produced goods can contribute to the CAP.

We asked attendees to describe in one word their concerns about climate change. These were the results:

BEST PRACTICES: PRIORITIES

Note: Attendees were asked to vote for the action items they would like to see implemented

- Promote water conservation and water-smart fixtures and appliances (1 dot)
- Increase waste diversion from construction and demolition debris (1 dot)
- Increase recycled and greywater use (3 dots)
- Increase the County's tree canopy (3 dots)
- Pilot carbon farming opportunities (0 dots)
- Develop extreme heat protocols for outdoor workers (0 dots)
- Develop comprehensive riparian restoration plans (1 dot)
- Expand Green Infrastructure to reduce run-off (1 dot)
- Enact reflectivity standards for new development to reduce impact of Heat Islands (0 dots)
- Expand number of water fountains and cooling stations (0 dots)
- Update safety protocols to include climate hazards (1 dot)
- Adopt Green Building/Zero Net Energy building standards (0 dots)
- Develop County-supported energy efficiency programs (3 dots)

- Develop and incentivize residential and commercial fuel switching programs (1 dot)
- Development of on-site and off-site renewable energy projects (1 dot)
- Promote/incentivize the sale of electric vehicles in the County (1 dot)
- Expand the number of public and private EV charging stations (0 dots)
- Promote transit-oriented development principles for new development (3 dots)
- Increase the number of local public transit options (2 dots)
- Increase shared mobility options (bikes, scooters, etc.) (0 dots)
- Pass ordinance banning non-essential single use items (4 dots)

Workshops #2 - Business and Vendor Perspectives

Date: March 14 @ 9:00-10:30am EST
Location: Online via Zoom
Attendee(s):

- Jensen Anderson, *Director of Community Engagement and Assistant to the President, Chapel Hill-Carrboro Chamber of Commerce*
- Leigh Anne King, *Clarion Associates*
- David Shaw, *CEO of Roc Records*
- Scott Czechlewski, CEO, *Hillsborough/Orange County (NC) Chamber of Commerce*

KEY TAKEAWAYS:

GREEN COMMUNITY

- Reducing energy use and climate footprint in land use requires accessible office space located in town, but finding such space is challenging due to limited availability, particularly for smaller firms.
- **Lack of affordable housing in their area could lead to people having to move further away and increase emissions from commuting.**
- While businesses care about the environment, they may be hesitant to participate in a green business program due to current financial struggles.
- Complexity, cost, and time will be significant factors in getting the business community interested in a **green business program. Need to start with easy, low-cost initiatives to get businesses invested,** with community support and incentives being key motivators for participation. **Food recovery program** could be a good first step.
- If lots of businesses are participating in the program, others will (marketing/publicity important)
- Need to talk with developers/HOAs for green infrastructure (get boots on ground perspective/support)

- Some communities have implemented a sustainability point system in their ordinances, allowing developers to choose from a list of sustainable options to earn benefits such as increased density or an **expedited process**. Providing this flexibility and offering sustainable options is the way forward for building development.
- **Opportunities for businesses to attract and retain customers through sustainability practices (brand loyalty). Local food network/recognition** The county could potentially support and create a network around this to encourage businesses to adopt sustainable practices.
    - Example: David Shaw is a music distributor and he is actively working on becoming more sustainable in their manufacturing and packaging practices to improve their brand and attract more business.
- **The county could provide resources such as networking sessions for businesses to share best practices and talk about cost, benefit, and analysis to help build out the conversation around sustainability practices.**

RESOURCE CONSERVATION

- David Shaw's Yep Roc label company, is interested in installing solar panels on their warehouse roof but the initial investment is a bit of a hurdle. **Solarize the Triangle** He suggests having incentives for businesses to convert to more sustainable power and even install electric vehicle chargers. He also has a palette disposal issue and would benefit from a reuse program, as would other similar businesses in the area. **Interest in building out a reuse market for C&D**
- There is a nonprofit organization called Don't Waste Durham[5] that has implemented a program to work with **local restaurants on using reusable takeout containers**, and there may be interest from business owners in the county to participate in similar programs if they are financially viable.
- **Incentivizing reusable practices such as bringing your own bag and offering discounts for businesses that participate**, rather than penalizing those who use plastic bags or take out containers, could be more effective in reducing waste.
- **Requiring new mixed-use spaces to have chargers for residents**, would be important for addressing the issue of limited charging access in rural areas.

BUILT ENVIRONMENT

- **Incentivizing LEED certification for construction through additional tax benefits** as a means of ensuring that county standards are being followed.

TRANSPORTATION

- It would be helpful for businesses to have an **EV playbook that guides them** on the different levels of chargers, electrical capacity, and the process for installing EV chargers.

[5] http://www.dontwastedurham.org

- Having quarterly networking sessions for discussing public transportation options for large manufacturing businesses and school buses could be helpful in reaching climate goal
- **Working with the chamber networks to develop education programs around the Commuter Options program** (Go Triangle program)
- More traffic may push people to take public transit, but there are interesting options beyond traditional transit, such as **Wilson, NC's micro transit program** partially paid for by the community. The program offers "on-demand trips' ' with smaller vehicles and are affordable.
- **Providing more bike racks and water stations, to encourage people to use alternative transportation such as walking and biking**
- Encouraging the inclusion of **bike racks or garages in new apartment construction** and showers in office buildings to increase bike usage and accessibility.

CLIMATE RESILIENCE

- Consider using tools like the CDC's Social Vulnerability Index and programs like Fern Leaf to identify disadvantaged populations in flood-prone areas and prioritize protection of important community assets from a safety standpoint.
- A discount or program to provide discounted generators for people with health issues who live in lower income areas would be helpful, especially since power outages can be a significant problem in those cases.
- Providing places like spray pads, pools, misters and similar amenities in outdoor malls and dining areas that can offer relief for people who do not have air conditioning during extreme heat events.
- Recommended to check out the Sustainable Development Code,[6] a helpful website with sustainable development provisions by type, for resources on land use planning and zoning.
- **Newsletter and quarterly network events would be a good way to disseminate information to the business community**.

[6] https://sustainablecitycode.org

Workshops #3 - Community and Environmental Priorities

Date:: March 15 @ 1:00pm-2:30pm EST
Location: Online via Zoom

Attendee(s):

- Blake Tedder, *Assistant Director of Engagement, Duke Forest*
- Victor Lancaster
- Melissa McCullough, *Vice Chair Orange Co Climate Council Chair, Climate Action Coalition of Orange Co.*
- Kristin Prelipp, *Orange County Community Relation*s
- Bill Black, *Co-founder of the Orange County Business Owner Advisory Team*
- William Ward

KEY TAKEAWAYS:

Climate Resilience

- To identify **emergency response center**, we should look at potential for resiliency hub at community center; solar and community gardens, resource to community and educational resource
    - Communicate out? What is the plan? Especially to underserved communities
    - Emergency services dept has communications in that regard, and community engagement office
    - Social media announcements
- Social media is used to get the word out when there are climate threats. For underserved communities, and for people who do not have access to social media, they rely on community leaders and non-profits, as well as churches to disseminate info.
- 1 out of 10 people speak Spanish as first language; important to tap into all communities and strengthen relationships
- Need programs to educate the public on climate impacts.
- Explore options for **engaging Duke or other local providers to approve or install microgrids and discuss potential concepts for implementing microgrids**. Duke Univ. created programs the county could apply for.
- Melissa: expanding green infrastructure: lots relevant to education, but need to enable and expand green runoff in more diffuse way in order to address at the source; maybe tax incentives, or just get people to help in local neighborhoods; problems caused by what has been done in the past

Resource Conservation

- Want to talk to Habitat about expanding reusable items networks so more can be reused in county
- We should focus not just on where things go after purchase, but looking more upstream (ex.: using durables and reusable items). For example we could work with restaurants to build reuse program; identify partners/vendors, maybe have incentive program led by county
- Priority is on collaborating with the community; leverage county education programs/resources
- A curbside composting program is effective and becoming a standard practice, but requires education to emphasize its importance, and it can be replicated in OC.
- Melissa is the chair of the local Sierra Club and is willing to act as a conduit and suggests the **Sierra Club could have a role in developing and implementing the CAP. She mentioned creating a train-the-trainer model.** Need to follow up with her. She would be open to the idea of reposting social media posts or leveraging their newsletter, to help with outreach.

Built Environment

- IRA **(Inflation Reduction Act)** could be a significant resource for non-profits, local governments, and businesses, but the summary is too long and requires someone to coordinate and educate groups on how to tap into it effectively.
- County to develop a **one-stop-shop type of website** to educate on CAP and sustainability practices.
- Advocate for low-income individuals regarding IRA funding, which flows through states, and suggests using state representatives or emailing the governor's office to ensure that the state does not drop the ball.
- **Natural gas is one of the biggest issues**, and proactive county efforts are needed to help transition from gas to electric, which may require intervention and support in funding, resources, and branding. Orange County home preservation coalition could be a valuable partner to help low-income people navigate the transition.
- Interest in Solarize the Triangle, but funding is currently a barrier. Need to have templates to secure funding and a 30% credit from the Inflation Reduction Act (IRA) to expedite the request, which could be a significant incentive for developers.
- The transition to EVs is slow and **needs more focus on multi-unit dwellings** and minimizing costs, along with finding ways to make charging more accessible
- Exploring micro-mobility options like e-bikes and infrastructure incentives.
- **Implementing a policy/requirement for all-electric new construction may face political challenges**
- Need to make sure no disincentives for EV conversion, e,g. in the form of increased registration fees

Green Community

- Breeze Farms serves as an incubator farm and a pilot for various sustainability features such as agro voltaics, EVSE, carbon sequestration, which presents a significant opportunity to weave climate action into discussions and explore how to best utilize the land
- The branding around native and water-efficient and landscapes will be very important
- **Audubon Society has programs/resources; could be good partner ("OC protects our pollinators")**
- **Promoting locally-sourced food is a low-hanging fruit** and an easy win in the Climate Action Plan, as there are already many farmers markets and a unified front could be created to link them together
- There is potential for an OC foods movement outside of restaurants.
- Opportunities to improve the natural environment include fighting sprawl, joining initiatives such as the Eno New Hope working group, which focuses on protecting and linking lands, as well as protecting streams.
- There is currently no value given to trees in Orange County and North Carolina, and exploring ways to quantify their value and compensate the county for cutting them down, such as through **a tree master plan**, could be a potential recommendation for the Climate Action Plan.
- Melissa suggests moving away from initiatives that promote transitioning lawns towards native landscaping, and recommends a program to accompany efforts to support pollinators.
- There are currently **no major obstacles for rainwater capture**, and there are online resources available, but more hands-on workshops and exploration of programs such as those in California could be beneficial. The EPA EnviroAtlas is worth looking into

Transportation

- **Need to find a better way to publicize county commuter program**
- The lack of bike lanes outside of Chapel Hill in the county and the high risk involved in using county roads are major barriers to walking and biking. Infrastructure improvements are necessary.
- While it may be challenging and expensive, there is an opportunity to coordinate with land linkage efforts for infrastructure, although wildlife habitat may pose some challenges for bike lanes.
- Bike infrastructure is a high priority, with a focus on creating an integrated network, securing funding sources, and linking opportunities with big employers, as well as exploring the possibility of converting abandoned railroads to bike/hike trails.

Workshops #4 - Student Voices

Date: March 23 @ 1:00pm-2:00pm EST
Location: Online via Zoom
Attendee(s):

- Environmental Club @ University of North Carolina at Chapel Hill
- 30 students participating in Climate Action Day

KEY TAKEAWAYS:

Resource Conservation

- Stickers in bathrooms and on washing machines were suggested as a way to encourage water-saving behaviors and promote more efficient washing cycles.
- Recycling bins were praised for being readily available in dorm rooms, while the addition of side-by-side recycling and trash bins in bathrooms was suggested for better waste separation.
- Presence of recycling and composting systems in dining halls and highlighted the involvement of the Green Guides program in educating students about proper waste sorting.
- The potential for implementing edible food recovery programs on campus was raised, as well as the focus on sustainability efforts by Caroline Dining Services.

• **Implementation of Water Conservation Measures:**

- Installing aerators in bathrooms and break rooms.
- Exploring the possibility of using dual handles in bathrooms for water conservation.
- Utilizing stickers in bathrooms and on washing machines to promote water-saving practices, such as adjusting washing cycles and reducing paper towel usage.

• **Effectiveness of Recycling System:**

- Recycling bins are provided in dorm rooms, but no trash cans are available.
- More trash cans than recycling bins on campus.
- Recycling and composting systems in dining halls.
- Green Guides program educates students on waste sorting.
- Accessibility of recycling facilities is considered good.

• **Improvement in Waste Disposal Infrastructure:**

- Suggestion for side-by-side recycling and trash bins in dorm rooms and bathrooms.
- Benefits of a 3-bin system or separate recycling and trash bins in all locations.

- **Potential for Edible Food Recovery Programs:**
  - Awareness of composting programs like Compost Mates.
  - Focus on sustainability in dining services, but no mention of edible food recovery programs.
  - Interest in exploring the possibility of implementing edible food recovery initiatives.

Green Community

- Incorporate green infrastructure practices, such as green roofs and rainwater collection systems, in campus buildings and facilities.
- Promote native and water-efficient plantings for landscapes on campus, reducing the use of pesticides and fertilizers.
- Explore collaborations with the local farm community to establish rooftop gardens and other innovative green initiatives on campus. For example, Eco-studio internships are focused on the edible campus gardens.

Climate Resilience

- Students consider climate impacts when making decisions about their future locations.
- Usage of reflective paint and the installation of misters in outdoor spaces on campus to mitigate heat island effects and enhance comfort for students, faculty, and staff.
- Assess the campus infrastructure to identify opportunities for incorporating stormwater catchment systems, swales, and vegetative solutions. These measures can help manage drought and flooding challenges, ensuring the availability and efficient use of water resources.

Transportation

- Acknowledgement that the Chapel Hill transit system has programs in place to promote bus usage
- Program to reserve or rent a bike on campus so that students are able to bike around the classes, or even off campus for a little.
- It was noted that charging stations are already available on campus, and efforts by organizations like Orange County Anytown are underway to increase their number.
- The idea of providing rental electric vehicles to students for specific purposes was suggested as an appealing benefit.
- Limited parking on campus promotes sustainable transportation.

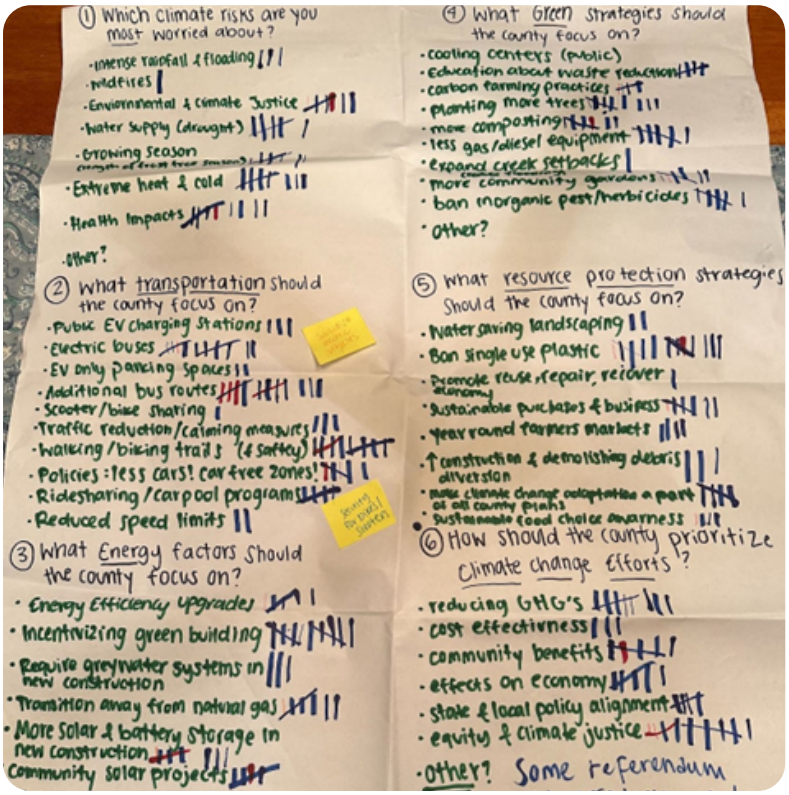
Built Environment

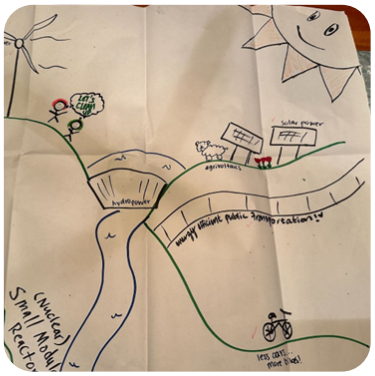
- The Renewable Energy Fee at UNC, managed by the Renewable Energy Special Projects Committee (RSPC), was mentioned, highlighting its significant budget and successful project implementation. The RSPC is a student-run committee that generates project ideas, presents proposals, and votes on funding allocation.

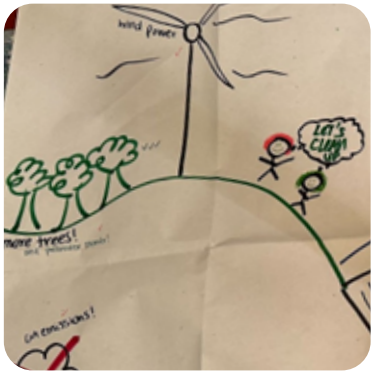
- Energy-saving measures implemented on campus included automated/sensor lights, solar panels on buildings, energy savings stickers, and low-flow showerheads.
- The potential use of technology and apps for waste sorting, water conservation, and sustainable choices was mentioned, although specific examples were not identified.

ADDITIONAL STUDENT OUTREACH

- Bladen Currier, Orange County Sustainability Intern did an outreach event at UNC's Climate Action Day on April 13– where she extrapolated survey questions and had students put a mark next to the ones they agreed with. She also had a mural out where students could add pictures of climate action measures they would like to see in our community.







Top Image: The survey questions from the outreach event at UNC's Climate Action Day on April 13, 2023. Images on right: Student mural project from the outreach event. Images by Bladen Currier.

Workshops #5 - Staff Perspectives

Date: April 20, 2023 @ 1:00pm-2:00pm EST

Location: Online via Zoom

Attendee(s):

- Bruce Woody, *Assistant Director of Solid Waste*
- Chad Phillips, *Deputy Tax Assessor*
- Janice Tyler, *Aging Director at Orange County Government*
- Rhea Colmar, *Nurse*
- Caroline Hausler, *Recycling Education and Outreach Coordinator*
- Amy Eckberg, *Sustainability Program Manager*

KEY TAKEAWAYS:

Resources Conservation

- **Inconsistency in Sustainable Resources across County Facilities:** Discrepancies in resources across different county bathrooms were highlighted. Differences include the presence of automatic faucets and air blowers in some facilities but not all, which necessitates the need to consider the trade-offs when implementing sustainable solutions like installing electric hand dryers versus using paper towels, especially in older buildings.
- **Proposal for Composting:** Composting was proposed as a potential addition to county buildings, although usage levels were uncertain.
- **Hybrid Working Model as a Resource Conservation Strategy:** The newly approved hybrid working model was cited as a positive move towards conserving gas and reducing traffic.
- **Preference for No Towels to support Conservation Efforts:** In order to save money and reduce waste, it was proposed that the county phase out the use of towels in the restrooms.
- **Need for Facility Design Changes for Resource Conservation:** Changes to facility design, like barrier-free entrances to restrooms, would be needed for some conservation measures. Challenges with temperature control were also noted, indicating room for optimization in heating and cooling systems.
- **Struggles with Recycling and Waste Management:** Struggles with recycling and waste management were identified. Public education on what materials are recyclable was cited as a major challenge, with policy initiatives such as wastewise events proposed as potential solutions.

Green Community

- **Promotion of Native Plants and Natural Landscaping:** The use of native plants and natural landscaping instead of maintaining green grass lawns was suggested, which could reduce chemical use and water consumption. The county was suggested to set an example for the community in this regard.
- **Appreciation for Local Farmers' Markets and Suggestions for Expansion:** Local farmers' markets were appreciated and suggestions were made for bringing these markets to county buildings for easy access to county employees. Expansion of farmers' markets to underserved areas to tackle food deserts was also proposed.
- **Opportunities within Agricultural Space:** There was a consensus on the potential to expand on initiatives within the agricultural or farming space.

Climate Resiliency

- **Implementation of 2018 Assessment:** One of the participants mentioned their involvement in the creation of the 2018 Assessment but was unsure whether the findings have been acted upon. It was suggested that the group needs to revisit the document, and potentially, COVID-19 has delayed some of the actions.
- **Emergency Response System:** It was stated that the county is doing well with its emergency response system, with improvements seen over the past five years. The system is effectively alerting the community during emergencies and efficiently setting up shelters.
- **Assessment of Parking Spaces:** A suggestion was made to assess the number of parking spaces and determine whether all are necessary. The idea is to reduce impervious pavement, lessen runoff, and create more green spaces. This approach aligns with a future vision of increased car-sharing, more public transportation, and reduced need for single-use vehicles.
- **Cycling Infrastructure:** It was recommended that the county invest more in creating safe spaces for cycling and preserving green spaces. The goal is to encourage residents to use alternative modes of transportation, such as bicycles, rather than relying on cars. A participant shared a vision for a greenway that connects different parts of the county, providing a safe and eco-friendly transportation route.

Transportation

- **Positive Response to EVs in County Fleet:** The introduction of EVs in the county's fleet is seen as a positive step, with a recognition that more work needs to be done.
- **Expansion of Bike Lanes and Greenways:** Upgrades to bike lanes in Chapel Hill were positively received. Staff suggest similar upgrades and the addition of long-distance greenways connecting all parts of Orange County.

- **Improvements in Public Transportation:** Public transportation in Northern Orange is limited, and bus routes/schedules don't cater to everyone. Smaller, energy-efficient buses or vans could be utilized during off-peak hours for a more reliable and frequent service.
- **Expansion of Mobility On-Demand Service:** There is a call to expand the mobility on demand service, which is currently limited in terms of hours and locations it's offered.
- **Micro-vehicles over Larger Buses:** A suggestion was made to switch from larger buses to smaller micro-vehicles in some areas.
- **Concerns About Aging County Fleet:** Concerns were raised about the aging and non-functional vehicles in the Orange County fleet, with an ongoing effort to improve the fleet.

Built Environment:

- **New Lighting System:** A new $46,000 lighting system has been installed to a County's facility to significantly reduce electricity use. This system uses sensors to turn off lights when rooms are not in use.
- **Policy-Driven Energy Efficiency:** There's a call for policy-driven approaches to energy efficiency, including mandating energy-efficient buildings for new constructions.
- **Water-Saving Measures:** Water-saving measures like aerators and low-flush toilets are mentioned as beneficial for energy saving.
- **Energy-Saving Education and Incentives:** Staff suggest more education or incentives to encourage energy-saving behaviors such as turning off lights and computers when not in use.

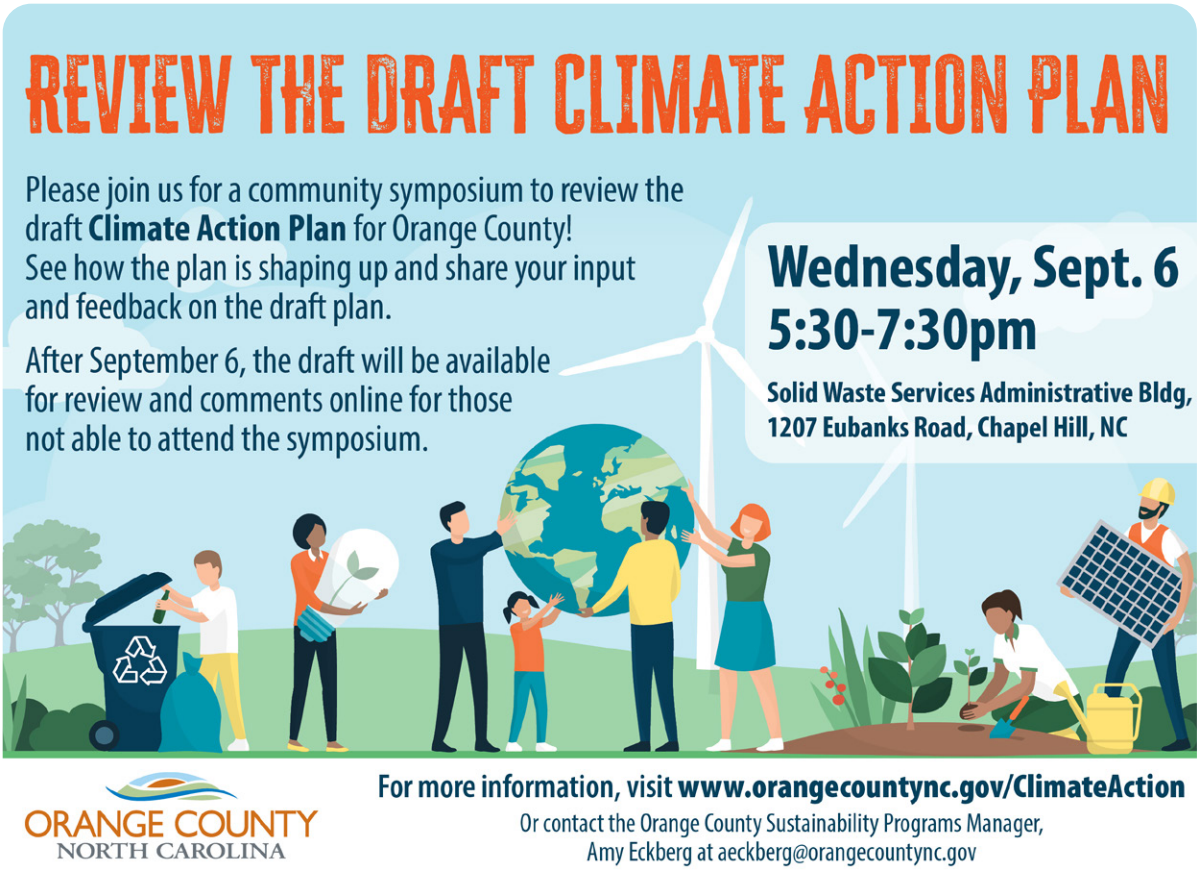
Community Symposium

Date:

Location:

Attendee(s):

KEY TAKEAWAYS:



Appendix D: Funding Mechanisms

The full description for all costs has been provided to the County, in a Climate Action Tracker, which accompanied this CAP, and is available upon request.

Type	Examples	Description
Special Benefit-Based Assessments	Community Improvement Fee	Levied on property owners to fund neighborhood enhancements.
Special Taxes	Open Space Preservation Tax	Tax on properties for preserving county open spaces and green areas.
Property Tax Increment	Tax Increment Financing	Incremental property tax revenue allocated for development projects.
Utility User Tax	Energy Consumption Tax	County tax on utility service consumption such as natural gas.
Parking Fee	County Parking Revenue	User fee for county-owned parking facilities.
Enterprise Fund	Waste Management Fund	Self-sustaining funds generated from county-owned enterprises.
Development Fee	Land Use Development Charge	Fee paid by developers for funding county infrastructure.
Carbon Development Impact Fee	Carbon Footprint Charge	Fee based on carbon emissions from developments to fund mitigation.
Congestion Pricing	Traffic Congestion Charge	User fee to reduce traffic congestion and raise funds.
Green Bond	Environmental Impact Bond	Bonds for capital improvements with an environmental focus.
Green Revolving Fund	Sustainability Investment Fund	An internal fund where savings from efficiency projects are reinvested in future green initiatives.
Energy Performance Contracts (EPC)	Energy Efficiency Agreement	Contracts for energy upgrades in exchange for cash flows from a portion of savings.
Public-Private Partnerships (PPP)	Renewable Energy Partnership	County partnerships with private companies for energy projects.
Infrastructure as a Service (IAAS)	Energy Infrastructure Lease	Leasing energy infrastructure from private entities for funds.

Appendix E: Funding Sources

ORANGE COUNTY
NORTH CAROLINA

Geography / Agency	Program	Description
Federal / DOT	DOT Surface Transportation Block Grant Program	Funding for public road, pedestrian, bicycle infrastructure, and transit capital projects.
Federal / DOT	DOT Transportation Alternatives Program	Funding for pedestrian/bicycle facilities, safe routes to schools, and other related projects / $20 million annually for NC
Federal / DOT	Charging and Fueling Infrastructure (CFI) Grant Program	Funding for deployment of publicly accessible electric vehicle charging infrastructure and other alternative fueling infrastructure.
Federal / DOE	Energy Efficiency and Conservation Block Grant Program	Funding for local governments for energy efficiency and conservation projects.
Federal / DOE	Energy Improvements in Rural or Remote Areas (ERA)	Funding for clean energy projects in rural or remote areas aiming to improve energy systems, reduce emissions, modernize infrastructure, develop microgrids, and enhance energy efficiency. Funding varies based on project specifics.
Federal / DOE	Energizing Rural Communities Prize (American-Made Challenges)	A $15 million prize challenging individuals and organizations to create plans or financing strategies for rural communities to enhance their energy systems and further clean energy projects.
Federal / EPA	Clean Diesel Funding Assistance Program	Grants and rebates for clean diesel projects, up to 50% of cost.
Federal / USDA	Rural Energy for America Program	Grants/Loans for agricultural producers and small businesses to purchase renewable energy systems; funding varies based on project.
Federal / DOE	Weatherization Assistance Program (WAP)	Provides funding to increase the energy efficiency of homes. Typically, up to $6,500 per home.

Geography / Agency	Program	Description
Federal / EPA	Diesel Emissions Reduction Act (DERA)	Grants to reduce diesel emissions; varies based on project size.
Federal / DHHS	Low Income Home Energy Assistance Program (LIHEAP)	Provides assistance to low-income households to help pay for energy bills and weatherization improvements
Federal (tax credits and deductions)	Inflation Reduction Act (IRA) various programs: ● The Empowering Rural America (New ERA) Clean ● Energy Investment Tax Credit (ITC) ● Clean Energy ITC Technology Neutral ● Clean Energy Production Tax Credit (PTC) ● Clean Energy Production Tax Credit (PTC) Technology Neutral ● Commercial Clean Vehicle Tax Credit ● Etc…	Provides various tax credits, deductions, grants, loans and bonds.
Federal (tax credits and deductions)	179D for energy efficiency initiatives	Section 179D of the U.S. tax code provides a tax deduction for building owners or designers who implement energy-efficient improvements in commercial buildings. Under Section 179D, eligible non-profit universities can claim a deduction of up to $1.88 per square foot for energy-efficient improvements made to their buildings. This includes upgrades to lighting, heating, cooling, and ventilation systems, as well as improvements to the building envelope, such as insulation and windows.
Federal / DOE	Property Assessed Clean Energy (PACE) Financing	Provides clean energy financing. Funding varies by program

Geography / Agency	Program	Description
Federal / EPA	Diesel Emissions Reduction Act (DERA) Program	Grants and rebates to reduce harmful emissions from diesel engines ($115 million for FY 22-23)
Federal / EPA	Clean Heavy-Duty Vehicle Program	Grants and rebates available for up to 100% of the costs associated with clean heavy-duty vehicles. Part of the Inflation Reduction Act.
Federal / EPA	Solar Energy System Tax credits	Tax credits for solar water heaters and PV systems. 30% of your total solar system costs as a federal tax credit.
Federal / FTA	Grants for Buses and Bus Facilities Program	Capital funding to replace, rehabilitate, and purchase buses and bus-related equipment
Federal / DOT	RAISE grants	Grants for transportation projects
Federal / FEMA	FEMA Pre-Disaster Mitigation Program	Grants to projects that implement long-term risk reduction from future hazards and climate events while reducing dependence on future federal disaster recovery assistance. Eligible projects include generator installation at critical facilities, eligible acquisition, elevation and mitigation reconstruction projects, and more
State	North Carolina's Utility Savings Initiative (USI)	Promotes energy savings in the state.
State	Energy Star Plus State Rebate Program	Provides rebates to residential customers for installing certain energy efficient appliances and equipment that are Energy Star certified. Rebates typically range from $50 - $500 per appliance.
State	Energy Improvement Loan Program (EILP)	Low-interest loans to fund energy efficiency, renewable energy, and water conservation projects for commercial, industrial, nonprofit, schools, and local government customers.

Geography / Agency	Program	Description
State	North Carolina Energy Efficiency Rebates	Offers rebates for homes/businesses implementing energy-efficient solutions; amounts vary by project.
State	North Carolina Department of Environmental Quality (DEQ) Volkswagen Settlement Mitigation Program	Funds for zero emission vehicle infrastructure and transportation, $92 million through 2027.
State	North Carolina Energy Office Appliance Rebate Program	Rebates for purchasing energy efficient appliances. Varies based on products.
State	North Carolina GreenPower Production Incentive	Payments for renewable energy produced; varies based on system size and energy generated.
State	North Carolina Green Business Fund	Offers grants and loans to small businesses and farms for implementing renewable energy, energy efficiency, and other sustainable practices.
State	Clean Water State Revolving Fund	Provides low-interest loans to commercial, industrial, nonprofits, schools, and local governments for funding a wide range of water infrastructure projects.
Regional / Piedmont Authority	Piedmont Clean Energy Program	Provides financial support for clean energy initiatives.
Regional / Piedmont Authority	Piedmont Together Zero Emission Vehicle Readiness Planning	Planning grant from Duke Energy for EV infrastructure development.
Regional / Central Pines Regional Council	Central Pines Regional Council Energy Planning & Technical Assistance	Free energy assessments and plan development support for local governments.
Local / OWASA	Orange County Water and Sewer Authority (OWASA) Programs	Offers rebates for water-efficient appliances and fixtures
Local / Duke Energy	Home Energy Improvement Program	Offers rebates for qualified energy efficiency improvements; up to $600 per home for various improvements.
Local / Duke Energy	Smart $aver Incentive[6] Program	On-bill financing program for certain energy efficiency improvements for homeowners and businesses. Varies.

[6] https://www.duke-energy.comhome/products/smart-saver

Appendix F: Comprehensive Funding Plan

ORANGE COUNTY
NORTH CAROLINA

The cost estimates are indicative and based on preliminary assessments, comparisons with similar programs, and expert input. They are meant to give a broad idea of the possible funding source(s) for each strategy. The estimates are not exhaustive and may be subject to change based on various factors such as inflation, specific requirements during the time of execution, emerging technological advancements, or adjustments in the scope of a given strategy. As we navigate the details of various grants and funding avenues, the allocation of dedicated staff resources cannot be overstated. A role such as a Grants Administrator is crucial for adeptly handling the nuances of grant processes and ensuring optimal use of the funds received. Allocating resources to such specialized staff positions underscores our commitment to both fiscal responsibility and the maximization of grant opportunities.

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POSSIBLE FUNDING SOURCE(S)
TRANSPORTATION			
T 1.1 Continue updating and executing the Orange County Transit Plan, addressing service gaps in Northern OC and scheduling issues.	2028	$360,163	U.S. FTA/DOT programs Operating and Capital budgets
T 1.2 Transition to smaller, energy-efficient buses or vans during peak hours, providing more adequate and reliable services in response to measured demand.	2024	$500,000	FTA/DOT programs Low interest loans Operating and Capital budgets
T 1.3 Explore innovative public transportation options	2024	$170,000	DOT programs
T 2.1 Initiate pilot marketing campaigns that use innovative means/methods to inform community about public transportation options/programs/incentives	2024	$20,000	Operating and Capital budgets
T 2.2 Partner with chamber networks to develop education programs around the Orange County Commuter Options program for implementation at private businesses.	2024	$10,000	Operating and Capital budgets
T 3.1 Publicize and promote bike trails and biking as an alternative means of transportation through Parks and Recreation educational programs, special events, promotions, outreach and marketing efforts.	2027	$10,927	Operating and Capital budgets
T 3.2 Create an e-bike subsidy program that provides higher subsidies for low income residents. Similar to what City of Raleigh and Denver are doing	2028	$562,754	State programs
T 3.3 Work with NCDOT and the Towns of Carrboro, Chapel Hill, Hillsborough and Mebane to explore the opportunities for closing roads to vehicle traffic occasionally or permanently.	2030	$238,810	State programs Operating and Capital budgets
T 4.1 Continue efforts to introduce more EVs into the county's fleet	2024		IRA funding DOT and DOE programs
T 4.2 Accelerate the transition to EVs in the community through advocacy, education and awareness	2024		DOT and DOE programs IRA funding
T 4.3 Explore the idea of providing rental EVs as an additional transportation option	2029		DOT and DOE programs IRA funding Operating and Capital budgets
T 5.1 Expand the "Driving is Exhausting" public education campaign	2031	$24,597	Operating and Capital budgets

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POSSIBLE FUNDING SOURCE(S)
RESOURCES CONSERVATION			
RC 1.1 Expand the existing reuse network with partner organizations, improving the ability to divert waste and increase the reuse of items within the county.	2025	$82,400	State (DEQ) grants Operating and Capital budgets
RC 1.2 Partner with local businesses and nonprofit organizations to build a comprehensive reuse program for items such as pallets, takeout containers, electronics and school supplies.	2025	$92,700	State (DEQ) grants Operating and Capital budgets
RC 1.3 Promote policies to eliminate non-essential single-use plastics and prioritize reusable foodware and utensils.	2027	$54,636	Operating and Capital budgets
RC 1.4 Develop comprehensive educational and outreach programs in conjunction with the Solid Waste Department, encouraging waste reduction and recycling, and fostering a more informed and actively involved community.	2024	$26,000	Operating and Capital budgets
RC 1.5 Evaluate the potential of a curbside composting program, backed by a county-led educational campaign on the importance and benefits of composting.	2028	$78,786	State (DEQ) grants Operating and Capital budgets
RC 1.6 Examine the implementation of an edible food recovery program, potentially in partnership with local restaurants and food pantries.	2028	$39,393	State (DEQ) grants Operating and Capital budgets USDA programs
RC 1.7 Work with the Solid Waste Department to conduct a post consumer waste audit of county facilities	2026	$27,583	Operating and Capital budgets
RC 2.1 Continue to install water-saving devices such as aerators and dual handles in county facilities and broaden these efforts to include other water-saving technologies; in partnership with all water providers	2024	$37,500	State (DEQ) grants Operating and Capital budgets
RC 2.2 Collaborate with educational institutions and the wider community to increase awareness about water-saving practices	2024	$95,500	Operating and Capital budgets
RC 2.3 Analyze facility design and usage to pinpoint opportunities for water conservation, including restrooms and optimized heating and cooling systems.	2031	$67,643	State grants Operating and Capital budgets
RC 2.4 Transition 20% of the community water supply to recycled water by 2035 from a 2019 baseline	2030	$155,227	State (DEQ) grants Operating and Capital budgets
RC 3.1 Transition at least one procurement item annually to a more sustainable option	2024	$0	N/A

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POSSIBLE FUNDING SOURCE(S)
RC 3.2 Eliminate purchasing of disposable or single-use plastics for nonessential uses for County operations	2031	$0	N/A
RC 3.3 Consider increasing the numbers of vendors who are small business-owned or run by people of minority identities as much as possible	2033	$0	N/A
RC 3.4 Establish Sustainable Materials Purchasing Guidelines with a list of construction materials with low embodied GHG emissions	2030	$11,941	Operating and Capital budgets
BUILT ENVIRONMENT & ENERGY			
BE 1.1 Continue and strengthen policies for yearly reductions in energy use in County operations	2024	$160,000	Green Revolving Fund
BE 1.2 Continue the transition to efficient lighting green infrastructure across all County facilities	2026	$212,180	Green Revolving Fund Energy Efficiency Grants Programs with local utility and U.S. DOE
BE 1.3 Advocate for policy-driven measures for energy efficiency in new construction for County facilities by recognizing developers at the Board of County Commissioner meetings	2026	$106,090	Programs with U.S. DOE
BE 1.4 Promote energy-saving behaviors through comprehensive education and incentive programs	2025	$10,300	Operating and Capital Budgets
BE 2.1 Proactively adopt and expand the use of clean energy solutions within County facilities and operations.	2025	$175,100	Federal Grants FEMA programs
BE 2.2 Explore partnerships and funding opportunities to address barriers to renewable energy adoption, such as the "Solarize the Triangle" program and the Inflation Reduction Act (IRA) funding.	2024	$20,000	Operating and Capital Budgets
BE 2.3 Leverage parking lots to apply solar canopies to increase renewable energy generation and to combat urban heat island effects.	2024	$0	N/A
BE 2.4 Continue to release rounds of the "Solarize the Triangle" program which would work to install solar on residences, businesses and nonprofits in Orange County	2024	$0	N/A
BE 2.5 Implement an expedited permitting process for all new solar projects across the county.	2024	$0	N/A

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POSSIBLE FUNDING SOURCE(S)
BE 2.6 Schedule a Focus Group to discuss capacity and implementation of agro voltaics and community solar projects.	2024	$5,000	Operating and Capital Budgets
BE 3.1 Facilitate the transition from natural gas to electricity, providing support in terms of funding, resources, and branding.	2024	$350,000	Local utility and state programs
BE 4.1 Re-design sustainability website for one-stop-shop information that educates public on the County's Climate Action Plan and sustainability practices, offering a centralized platform for information and resources	2024	$76,006	Operating and capital budgets
BE 4.2 Develop a program to support businesses in adopting sustainable practices	2026	$397,838	IRA funding for charging infrastructure
BE 4.3 Develop volunteer energy ambassador program. Use ambassadors to provide education about energy saving tips and resources	2025	$30,900	Operating and capital budgets
BE 5.1 Formalize and enhance the commitment to achieving LEED standards for County facilities	2031	$0	N/A
BE 5.2 Encourage the use of geothermal ground-source heat pumps in more County buildings, based on the success of current implementations.	2031	$860,912	IRA funding
BE 5.3 Invest in training and salary increases for permitting department to research green building materials/methods and do engineering work in-house to lower cost	2032	$164,680	IRA funding (Low-Carbon Transportation Materials Grants program) and LEED credits
GREEN COMMUNITY			
GC 1.1 Continue and enforce policies that preserve a significant percentage of acreage from new developments, with an emphasis on natural landscapes and native plants.	2025	$0	N/A
GC 1.2 Reduce/eliminate amount of mowed/ manicured lawns on County properties; replace with native pollinator gardens, native grasses	2027	$120,200	Operating and Capital budgets
GC 2.1 Create a tree master plan, quantifying the value of trees to preserve and increase tree cover across the county.	2029	$127,520	Operating and Capital budgets Conservation Trust Grants
GC 3.1 Expand and promote initiatives within the agricultural space, potentially including collaborations with local farms and Orange County Master Gardeners for innovative practices like rooftop gardens and agro voltaics.	2028	$28,138	Operating and Capital budgets Community Garden Grants

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POSSIBLE FUNDING SOURCE(S)
GC 4.1 Strengthen the branding and promotion of locally sourced food, linking together existing farmers' markets and creating a unified front to support an Orange County foods movement.	2025	$41,200	Operating and Capital budgets Agricultural Grants
GC 5.1 Encourage the use of County land for sustainable farming practices and education, leveraging Breeze Farms as a model for sustainable farming; increasing sustainable farming acres by 5% each year beginning in 2025	2025	$41,200	Operating and Capital budgets
GC 6.1 Develop programs and educational resources to promote native landscaping, community gardens and support pollinators, potentially in partnership with organizations like the Audubon Society and Master Gardeners.	2031	$49,195	Operating and Capital budgets
GC 6.2 Expand workshops and resources for rainwater capture, learning from successful programs in other regions and leveraging tools like the EPA's EnviroAtlas	2030	$65,673	Operating and Capital budgets
GC 6.3 Utilize the County's existing Lands Legacy Program to conserve important natural and cultural resources, working with the Eno-New Hope Landscape Conservation Plan and other initiatives to improve the natural environment through protection and linkage of lands and stream protection	2030	$23,881	Operating and Capital budgets
GC 6.4 Convert abandoned railroad corridors and integrate into bike/hike trail networks bringing about positive impacts on mental health, transportation emissions, and the economy	2024	$700,000 per mile	Operating and Capital budgets
GC 6.5 Expand Community Climate Action Grant program to provide funding to community projects that support the strategies in this CAP	2024	$0	N/A
GC 6.6 Phase out off-road fossil fuel engines (landscaping and construction equipment, recreational vehicles, etc.)	2026	$265,225	Operating and Capital budgets
RESILIENT COMMUNITY			
CR 1.1 Continue updating the FEMA Hazard Mitigation Plan and ensure effective implementation of the Eno-Haw Regional Hazard Mitigation Plan.	2030	$65,673	FEMA grants Operating and capital budgets
CR 1.2 Develop and promote a clear communication plan for underserved communities during climate threats, leveraging social media, community leaders, non-profits, and churches.	2026	$36,071	Operating and capital budgets

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POSSIBLE FUNDING SOURCE(S)
CR 1.3 Implement a program for discounted battery powered generators for lower-income residents with health issues who may be affected by power outages.	2032	$101,342	Federal (EPA) and state grants Operating and capital budgets
CR 1.4 Identify, fund, and prepare existing and new public facilities to serve as resilience hubs	2030	$253,139	FEMA grants
CR 2.1 Expand the use of green infrastructure to manage stormwater runoff, considering incentives to encourage implementation in local neighborhoods.	2027	$43,709	Upper Neuse River Basin Association funds
CR 2.2 Assess strategies for reducing impacts of climate change on public infrastructure	2027	$60,100	EPA grants Parks and Recreation Trust Fund
CR 3.1 Develop programs to educate the public on climate impacts	2031	$66,413	BOCC-appropriated funds
CR 3.2 Disseminate climate resilience information to the business community through newsletters and regular networking events.	2030	$11,941	Operating and Capital budgets
CR 3.3 Follow through on recommendations from the Triangle Regional Resilience Assessment, ensuring its findings are acted upon and incorporated into ongoing climate resilience efforts.	2028	$33,765	Operating and Capital budgets
CR 4.1 Conduct a Heat Island Mapping Study	2025	$20,600	State grants
CR 4.2 Encourage and prioritize the conservation of green spaces in the County to serve as natural buffers against climate impacts, continuing the goal of conserving a significant portion of total County land area.	2025	$41,200	Land Conservation Fund
CR 4.3 Expand green infrastructure program to reduce impermeable surface areas and capture runoff from paved areas	2032	$63,339	Federal (EPA) grants Operating and Capital budgets
CR 5.1 Continue outreach and comprehensive care strategies for vulnerable populations	2024	$15,000	Operating and Capital budgets
CR 6.1 Incorporate climate preparedness into County programs, operations, and maintenance protocols	2024	$20,000	Operating and Capital budgets
CR 6.2 Integrate CAP goals into County projects as an order of business	2024	$15,000	Operating and Capital budgets
CR 6.3 Provide funding for more sustainability staff and in order to implement strategies, provide community outreach and apply for funding grants	2024	$125,000	Operating Budget Community Climate Action Grant Program

Appendix G: Comprehensive Implementation Plan

ORANGE COUNTY
NORTH CAROLINA

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
TRANSPORTATION			
T 1.1 Continue updating and executing the Orange County Transit Plan, addressing service gaps in Northern OC and scheduling issues.	2028	Transportation	Orange County Public Transportation, GoTriangle, Durham-Chapel Hill Metropolitan Planning Organization (DCHC-MPO), Chapel Hill Transit, UNC-Chapel Hill and the towns of Chapel Hill, Carrboro and Hillsborough
T 1.2 Transition to smaller, energy-efficient buses or vans during peak hours, providing more adequate and reliable services in response to measured demand.	2024	Transportation	Orange County Transportation
T 1.3 Explore innovative public transportation options	2024	Transportation	TDM Coordinator, Orange County Transportation; EVS for Orange; "TransLoc." rideshare app features
T 2.1 Initiate pilot marketing campaigns that use innovative means/methods to inform community about public transportation options/programs/ incentives	2024	Transportation	TDM Coordinator, Orange County Transportation; PIO office to come up with a "Just the Bus" or similar campaign(s), distribute through communication networks
T 2.2 Partner with chamber networks to develop education programs around the Orange County Commuter Options program for implementation at private businesses.	2024	Transportation	Hillsborough-Orange County Chamber of Commerce, Chapel Hill-Carrboro Chamber of Commerce
T 3.1 Publicize and promote bike trails and biking as an alternative means of transportation through DEAPR educational programs, special events, promotions, outreach and marketing efforts.	2027	DEAPR	DEAPR, Climate Action Coalition of Orange Co.; local bike shops, Carolina Tarwheels; BikeWalkNC; Chapel Hill Cycling; Bicycle Alliance of Chapel Hill
T 3.2 Create an e-bike subsidy program that provides higher subsidies for low income residents. Similar to what City of Raleigh and Denver are doing.	2028	Sustainability/ Transportation	TDM Coordinator to work with El Centro Hispano, Rogers-Eubanks Neighborhood Association, Marion Cheek Jackson Center
T 3.3 Work with NCDOT and the Towns of Carrboro, Chapel Hill, Hillsborough and Mebane to explore the opportunities for closing roads to vehicle traffic occasionally or permanently.	2030	Transportation	Internal
T 4.1 Continue efforts to introduce more EVs into the county's fleet.	2024	Transportation	Internal
T 4.2 Accelerate the transition to EVs in the community through advocacy, education and awareness.	2024	Sustainability	Car dealers provide incentives; EVS for Orange; Climate Action Coalition of Orange Co. Triangle Clean Cities Coalition
T 4.3 Explore the idea of providing rental EVs as an additional transportation option.	2029	Sustainability	Hertz Rental Car; EVS for Orange' Climate Action Coalition of Orange Co.

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
T 5.1 Expand the "Driving is Exhausting" public education campaign.	2026	Sustainability Solid Waste Services Transportation	Chapel Hill-Carrboro Public Schools; Orange County Schools; PTAs; Triangle Clean Cities
RESOURCES CONSERVATION			
RC 1.1 Expand the existing reuse network with partner organizations, improving the ability to divert waste and increase the reuse of items within the county.	2025	Solid Waste Services Sustainability Housing	Waste hauler, Habitat for Humanity, Solid Waste Convenience Centers, Climate Action Coalition of Orange Co.
RC 1.2 Partner with local businesses and nonprofit organizations to build a comprehensive reuse program for items such as pallets, takeout containers, electronics and school supplies.	2025	Solid Waste Services Economic Development	Climate Action Coalition of Orange Co., Community Worx, Chamber of Commerces
RC 1.3 Promote policies to eliminate non-essential single-use plastics and prioritize reusable food ware and utensils.	2027	Solid Waste Services	Internal
RC 1.4 Develop comprehensive educational and outreach programs in conjunction with the Solid Waste Department, encouraging waste reduction and recycling, and fostering a more informed and actively involved community.	2024	Solid Waste Services	Waste hauler
RC 1.5 Evaluate the potential of a curbside composting program, backed by a county-led educational campaign on the importance and benefits of composting.	2028	Solid Waste Services	Internal, waste hauler, Waste Reduction Partners to conduct audits
RC 1.6 Examine the implementation of an edible food recovery program, potentially in partnership with local restaurants and food pantries.	2028	Solid Waste Services	Table Feeding Local Hungry Kids, Orange County Food Council, OC Food Bank, Second Harvest Food Bank of Orange County, Orange County's Food Assistance Program
RC 1.7 Work with the Solid Waste Department to conduct a post consumer waste audit of county facilities.	2026	Solid Waste Services	Solid Waste Services, Waste hauler; build into annual Franchise
RC 2.1 Continue to install water-saving devices such as aerators and dual handles in county facilities and broaden these efforts to include other water-saving technologies; in partnership with all water partners.	2024	Asset Management Services	Orange County Water and Sewer Authority
RC 2.2 Collaborate with educational institutions and the wider community to increase awareness about water-saving practices.	2024	DEAPR	Orange County Water and Sewer Authority, UNC

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
RC 2.3 Analyze facility design and usage to pinpoint opportunities for water conservation, including restrooms and optimized heating and cooling systems.	2031	Asset Management Services	Orange County Water and Sewer Authority
RC 2.4 Transition 20% of the community water supply to recycled water by 2035 from a 2019 baseline	2030	Planning Asset Management Services	Orange County Water and Sewer Authority
RC 3.1 Transition at least one procurement item annually to a more sustainable option	2024	Finance and Administrative Services	Internal
RC 3.2 Eliminate purchasing of disposable or single-use plastics for nonessential uses for County operations	2031	All	Internal
RC 3.3 Consider increasing the numbers of vendors who are small business-owned or run by people of minority identities as much as possible	2033	Finance and Administrative Services	Internal
RC 3.4 Establish Sustainable Materials Purchasing Guidelines with a list of construction materials with low embodied GHG emissions	2030	Finance and Administrative Services Asset Management Services	Best Practices
BUILT ENVIRONMENT AND ENERGY			
BE 1.1 Continue and strengthen policies for yearly reductions in energy use in County operations	2024	Asset Management Services	Internal
BE 1.2 Continue the transition to efficient lighting green infrastructure across all County facilities	2026	Asset Management Services	Internal, ESCOs Duke Energy Saver Program
BE 1.3 Advocate for policy-driven measures for energy efficiency in new construction for County facilities by recognizing developers through newsletters and similar County communication networks	2026	Asset Management Services	Internal
BE 1.4 Promote energy-saving behaviors through comprehensive education and incentive programs	2025	Asset Management Services/ Sustainability	Internal
BE 2.1 Proactively adopt and expand the use of clean energy solutions within County facilities and the community.	2025	Asset Management Services/ Sustainability	Duke Energy Dominion Energy North Carolina Piedmont Electric Cooperative
BE 2.2 Explore partnerships and funding opportunities to address barriers to renewable energy adoption, such as the "Solarize the Triangle" program and the Inflation Reduction Act (IRA) funding.	2024	Sustainability	EmPOWERment, Duke Energy, Dominion Energy North Carolina, Piedmont Electric Cooperative, Triangle Sustainability Partnership, NC Clean Energy Fund

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
BE 2.3 Leverage parking lots to apply solar canopies to increase renewable energy generation and to combat urban heat island effects.	2024	Asset Management Services/ Sustainability	Solar siting survey consultant
BE 2.4 Continue to release rounds of the "Solarize the Triangle" program which would work to install solar on residences, businesses and nonprofits in Orange County.	2024	Sustainability	Triangle Sustainability Partnership
BE 2.5 Implement an expedited permitting process for all new solar projects across the county.	2024	Planning	Internal
BE 2.6 Schedule a Focus Group to discuss capacity and implementation of agro voltaics and community solar projects.	2024	Sustainability, Cooperative Extension	Orange County Ag Summit, NC Clean Technology Center
BE 3.1 Facilitate the transition from natural gas to electricity, providing support in terms of funding, resources, and branding.	2024	Asset Management Services	ESCOs, Utility companies
BE 4.1 Re-design sustainability website for one-stop-shop information that educates public on the County's Climate Action Plan and sustainability practices, offering a centralized platform for information and resources	2024	Sustainability	Internal
BE 4.2 Develop a program to support businesses in adopting sustainable practices	2026	Sustainability	Green Business Program Best Practices
BE 4.3 Develop volunteer energy ambassador program. Use ambassadors to provide education about energy saving tips and resources	2025	Sustainability	El Centro Hispania, Climate Action Coalition of Orange Co., Orange County Home Preservation Coalition, Commission for the Environment
BE 5.1 Formalize and enhance the commitment to achieving LEED standards for County facilities	2031	Asset Management Services/Planning	Internal
BE 5.2 Encourage the use of geothermal ground-source heat pumps in more County buildings, based on the success of current implementations.	2031	Asset Management Services	Internal, ESCOs
BE 5.3 Invest in training and salary increases for permitting department to research green building materials/ methods and do engineering work in-house to lower cost	2032	Planning	Internal

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
GREEN COMMUNITY			
GC 1.1 Continue and enforce policies that preserve a significant percentage of acreage from new developments, with an emphasis on natural landscapes and native plants.	2025	Planning, DEAPR	Cooperative Extension, Eno River Association, Triangle Land Conservancy
GC 1.2 Reduce/eliminate amount of mowed/manicured lawns on County properties; replace with native pollinator gardens, native grasses	2027	DEAPR	Soil & Water Conservation District, Cooperative Extension
GC 2.1 Create a Tree Master Plan, quantifying the value of trees to preserve and increase tree cover across the county.	2029	DEAPR	Soil & Water Conservation District, Commission for the Environment
GC 3.1 Expand and promote initiatives within the agricultural space, potentially including collaborations with local farms and Orange County Master Gardeners for innovative practices like rooftop gardens and agro voltaics.	2028	Cooperative Extension, Economic Development, DEAPR	Orange County Master Gardeners, Good Agricultural Practices (GAP) Certification
GC 4.1 Strengthen the branding and promotion of locally sourced food, linking together existing farmers' markets and creating a unified front to support an Orange County foods movement.	2025	Cooperative Extension, DEAPR	Refugee Community Partnership, Soil & Water Conservation District, OC Food Bank, Second Harvest Food Bank
GC 5.1 Encourage the use of County land for sustainable farming practices and education, leveraging Breeze Farms as a model for sustainable farming; increasing sustainable farming acres by 5% each year beginning in 2025	2025	Cooperative Extension, DEAPR	Eno River Association, Soil & Water Conservation District, Ag Summit, Carolina Farm Stewardship Association
GC 6.1 Develop programs and educational resources to promote native landscaping, community gardens and support pollinators, potentially in partnership with organizations like the Audubon Society and Master Gardeners.	2031	Cooperative Extension, DEAPR	Audubon Society, Master Gardeners
GC 6.2 Expand workshops and resources for rainwater capture, learning from successful programs in other regions and leveraging tools like the EPA's EnviroAtlas	2030	DEAPR, Cooperative Extension	EPA's EnviroAtlas, Master Gardener

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
GC 6.3 Utilize the County's existing Lands Legacy Program to conserve important natural and cultural resources, working with the Eno-New Hope Landscape Conservation Plan and other initiatives to improve the natural environment through protection and linkage of lands and stream protection	2030	DEAPR	Eno River Association, Soil & Water Conservation District
GC 6.4 Convert abandoned railroad corridors and integrate into bike/hike trail networks bringing about positive impacts on mental health, transportation emissions, and the economy	2024	DEAPR	Internal
GC 6.5 Expand Community Climate Action Grant program to provide funding to community projects that support the strategies in this CAP	2024	Sustainability	Internal
GC 6.6 Phase out off-road fossil fuel engines (landscaping and construction equipment, recreational vehicles, etc.)	2026	DEAPR, Solid Waste Services	Internal
RESILIENT COMMUNITY			
CR 1.1 Continue updating the FEMA Hazard Mitigation Plan and ensure effective implementation of the Eno-Haw Regional Hazard Mitigation Plan.	2030	Emergency Services	Internal
CR 1.2 Develop and promote a clear communication plan for underserved communities during climate threats, leveraging social media, community leaders, non-profits, and churches.	2031	Emergency Services, Aging, Social Services	El Centro Hispano, Nami Orange County. PORCH Hillsborough, Orange County Rescue Mission, Orange County Home Preservation Coalition, Marion Cheek Jackson Center, Orange County Community Centers
CR 1.3 Implement a program for discounted battery powered generators for lower-income residents with health issues who may be affected by power outages.	2032	Emergency Services, Social Services, Housing, Aging	El Centro Hispano, Nami Orange County. PORCH Hillsborough, Orange County Rescue Mission, Orange County Home Preservation Coalition, Marion Cheek Jackson Center, Orange County Community Centers, Refugee Community Partnership
CR 1.4 Identify, fund, and prepare existing and new public facilities to serve as resilience hubs	2030	Emergency Services/ Sustainability, Asset Management Services	Orange County Public Library, Rogers Road Community Center, Efland Cheeks Community Center, Cedar Grove Community Center
CR 2.1 Expand the use of green infrastructure to manage stormwater runoff, considering incentives to encourage implementation in local neighborhoods.	2027	Sustainability, DEAPR, Asset Management Services	UNC, Durham Tech research, Community Climate Action grant funding, Urban Sustainability Solutions

STRATEGY	IMPLEMENTATION YEAR	IMPLEMENTATION LEAD	POTENTIAL PARTNERS
CR 2.2 Assess strategies for reducing impacts of climate change on public infrastructure	2027	Sustainability, Asset Management Services	The Triangle Climate Resilience Partnership
CR 3.1 Develop programs to educate the public on climate impacts	2031	Sustainability, Community Relations	"I Pledge ," "Just the Bus" and "Leave the Leaves" campaigns
CR 3.2 Disseminate climate resilience information to the business community through newsletters and regular networking events.	2030	Economic Development, Sustainability	Chamber and faith based organizations newsletters, student environmental clubs, rotaries, etc.
CR 3.3 Follow through on recommendations from the Triangle Regional Resilience Assessment, ensuring its findings are acted upon and incorporated into ongoing climate resilience efforts.	2028	Emergency Services/ Sustainability/ Planning	The Triangle Climate Resilience Partnership
CR 4.1 Conduct a Heat Island Mapping Study	2025	Sustainability, DEAPR, Planning	North Carolina State Climate Office
CR 4.2 Encourage and prioritize the conservation of green spaces in the County to serve as natural buffers against climate impacts, continuing the goal of conserving a significant portion of total County land area.	2025	DEAPR, Planning	Ag Summit, CooperativeExtension, Soil & Water Conservation District, Eno River Association, Triangle Land Conservancy
CR 4.3 Expand green infrastructure program to reduce impermeable surface areas and capture runoff from paved areas	2032	Asset Management Services/Planning	Cooperative Extension, Soil & Water Conservation District, Eno River Association, Triangle Land Conservancy, Urban Sustainability Solutions
CR 5.1 Continue outreach and comprehensive care strategies for vulnerable populations	2024	Aging, Social Services, Health Department	El Centro Hispano, Nami Orange County. PORCH Hillsborough, Orange County Rescue Mission
CR 6.1 Incorporate climate preparedness into County programs, operations, and maintenance protocols	2024	Asset Management Services, Sustainability, Emergency Services	Internal
CR 6.2 Integrate CAP goals into County projects as an order of business	2024	All Departments	Internal
CR 6.3 Provide funding for more sustainability staff and in order to implement strategies, provide community outreach and apply for funding grants	2024	Finance and Administrative Services	Internal

Appendix H: Emission Reduction Analysis

ORANGE COUNTY
NORTH CAROLINA

TRANSPORTATION

Action Steps	Emissions Impact
T 1.1.1 Hire a Transportation Demand Management Coordinator	Medium
T 1.1.2 Implement changes to address service gaps in Northern OC by 2030	Medium
T 1.1.3 Extend service hours by 3% and locations by 3% by 2030	Medium
T 1.2.1 Develop plan to transition to EV buses	High
T 1.2.2 Monitor and adjust peak schedules to ensure more adequate and reliable services in response to measured demand.	Medium
T 1.3.1 Conduct a comprehensive study on successful micro-transit programs in other regions for reference and insight; (i.e.Shared bike/car/scooter programs)	Medium
T 1.3.2 Carry out stakeholder engagement to understand local commuting needs and identify key areas that would benefit from micro-transit.	Low
T 1.3.3 Expand Orange County Mobility on Demand services in selected areas	Medium
T 2.1.1 Partner with Health Department on messaging campaigns to emphasize health benefits of commuting (cleaner air)	Low
T 2.1.2 Expand Orange County Commuter Options program community-wide participation by 5% annually from 2025 to 2030	Medium
T 2.2.1 Collaborate with chamber networks to host one Orange County Commuter Options program seminar annually.	Medium
T 3.1.1 Cross promote rides and educational programs with Parks and Recreation and Health Department to emphasize the health benefits of biking.	Low
T 3.1.2 Partner with local bike shops and bike clubs to provide programs on bike safety and bike rides	Low
T 3.2.1 Develop an E-Bike Subsidy Allocation Plan: In collaboration with local stakeholders and transportation experts, develop a plan that outlines the structure of the e-bike subsidy program	Low
T 3.2.2 Implement a Subsidy Application and Distribution Process: Create a clear and accessible application process for residents to apply for the e-bike subsidy	Low
T 3.3.1 Identify road closures in high traffic walkable areas of town	Medium
T 4.1.1 Implement “EV-first” vehicle purchasing policy to ensure that EVs are considered as the primary replacement option for every vehicle	Medium
T 4.1.2 Develop an EV maintenance training program and training on how to address and provide EV road assistance	Low
T 4.1.3 Conduct a review of charging infrastructure deployment, with an emphasis on rural connectivity, by 2025	High
T 4.1.4 Develop a policy to reimburse County staff who charge County vehicles at their personal residence	Low
T 4.2.1 Increase number of EV charging stations community-wide	High
T 4.2.2 Apply for grants for EV infrastructure expansion	High
T 4.2.3 Create an EV playbook for businesses detailing different levels of chargers, electrical capacity, and the process for installing EV chargers	Medium

TRANSPORTATION CONTINUED

Action Steps	Emissions Impact
T 4.2.4 Partner with Triangle Clean Cities and/or NC State Clean Technology Center to host an annual EV webinar/workshop for residents and commercial businesses	Medium
T 4.2.5 Add screening/landscaping/shade standards for EV charging stations.	Low
T 4.2.6 Prepare and improve our capabilities to respond to EV related emergencies	Medium
T 4.3.1 Conduct feasibility study for a rental EV program	Low
T 4.3.2 Pilot a rental EV program at a strategic location	Medium
T 4.3.3 Develop an EV ambassador program- Current EV drivers who can show off their vehicles at farmer's markets and participate in events like National Drive Electric Week to provide education/answer questions	Low
T 5.1.1 Continue to partner with local schools to incorporate anti-idling signages at school drop-off/pick-up zones	Low
T 5.1.2 Support the transition to EV buses at schools county-wide	High
T 5.1.3 Expand anti -idling program to other types of county vehicles such as Sheriff's Office vehicles	Low

RESOURCE CONSERVATION

Action Steps	Emissions Impact
RC 1.1.1 Add one new partner organization to the reuse network annually; add resource to website (BE4.1)	Low
RC 1.1.2 Identify and increase accepted reuse items at the county's Solid Waste Convenience Centers; report tonnage each year in overalll diversion; add resource to website (BE4.1)	Low
RC 1.1.3 Promote Habitat for Humanity which sells new and used furniture, building materials, appliances and household goods at discounted prices; add resource to website (BE4.1)	Low
RC 1.1.4 Set up a recycling and donation location for old gas appliances at the County Solid Waste Convinence Centers; add resource to website (BE4.1)	Medium
RC 1.2.1 Regularly track and report the program's impact on waste reduction.; add resource to website (BE4.1)	Low
RC 1.2.2 Consider implementing a “repair café” at libraries where residents can go to get help repairing common household items and electronics to keep them in circulation longer	Low
RC 1.3.1 Promote a “Don’t Waste Orange County” program, similar to Durham’s Green to Go program	Low
RC 1.4.1 Launch annual community Zero Waste workshop in partnership with the Solid Waste Department	Low
RC 1.5.1 Complete a feasibility study for a curbside composting program by 2031 as part of the County's updated waste hauler agreement	Medium
RC 1.5.2 Work with the Solid Waste Department to launch an educational campaign on composting benefits.	Medium
RC 1.6.1 Work with Cooperative Extension and other partners to expand funding to build out the food recovery program	Medium
RC 1.7.1 Select one dumpster from county facilities that would be emptied and sorted into material type	Low
RC 1.7.2 Make a list of items that are not recyclable	Low
RC 1.7.3 From this list, pinpoint where these non recyclable items are being generated and determine how to eliminate them completely	Low
RC 2.1.1 Install water-saving devices in two additional county facilities annually. (i.e low flow)	Low
RC 2.1.2 Regularly review and upgrade to newer water-saving technologies.	Low
RC 2.2.1 Utilize parks and other County owned facilities as demonstration areas that also include interpretive educational signage on water-savings practices	Low
RC 2.2.2 Distribute water-saving practice stickers in county facilities and residential properties	Low
RC 2.2.3 Provide water conservation kits in partnership with all water providers	Medium
RC 2.3.1 Conduct annual audits of county facilities to identify water-saving and energy-savings opportunities.	Medium
RC 2.3.2 Implement identified savings measures in all facilities	Low
RC 2.4.1 Consider implementing a Rainwater Rewards program similar to the City of Raleigh’s to help businesses and residences capture stormwater runoff, reduce flood impacts, and help prevent water pollutants from entering storm drains and streams	Medium

RESOURCE CONSERVATION

Action Steps	Emissions Impact
RC 3.1.1 Identify item using the list from the waste audit as outlined in Action RC 1.7.1	Low
RC 3.2.1 Implement reuse items for break rooms and meetings/events	Low
RC 3.2.2 Buy bulk when available	Low
RC 3.3.1 Acknowledge the importance of this consideration during planning sessions	Low
RC 3.3.2 Mention this acknowledgement in county grant proposals	Low

BUILT ENERGY AND ENVIRONMENT

Action Steps	Emissions Impact
BE 1.1.1 Achieve a 20% energy usage reduction in county operation by 2035 using a 2019 baseline	High
BE 1.1.2 Install energy-efficient technologies in two County facilities each year	High
BE 1.2.1 Replace traditional lighting with LEDs in all county facilities by 2030	High
BE 1.2.2 Evaluate high energy use in two County buildings for deployment of green infrastructure measures: vertical gardens and tree plantings to reduce energy used to cool these buildings by 2030	Medium
BE 1.3.1 Provide an exhaustive list of all possible commercial and residential rebate programs on the County's website (BE4.1)	High
BE 1.3.2 Advocate for an all electric building code with the North Carolina Building Code Council	High
BE 1.4.1 Launch annual energy-saving education program to encourage actions such as turning off lights, powering down computers, and conducting energy audits	Medium
BE 2.1.1 Complete a solar siting survey for County facilities [1]	High
BE 2.1.2 Consider adding electric battery storage to critical facilities and resilience hubs identified in CR 1.4.1	Medium
BE 2.1.3. Continue with the "Solarize the Triangle" program among commercial and residential communities	High
BE 2.1.4 Regularly monitor, review, and comment on utility programs and legislative proposals impacting the adoption of clean energy in the County to ensure they align with the County's climate action goals.	High
BE 2.1.5 Provide training to staff on maintenance of renewable energy systems	Medium
BE 2.2.1 Participate in Duke Energy's "Green Source Advantage Choice" program to secure renewable energy from projects connected to the Duke Energy grid	High
BE 2.2.2 Incorporate the 10-year avoided cost bill credit option that Duke Energy is offering to receive a rebate for the cost of avoided utility infrastructure expenses	Low
BE 2.2.3 Secure IRA funding for four renewable energy projects by 2035.	High
BE 2.3.1 Include analysis on locations as part of the Solar Siting Survey (BE 2.1.1)	Medium
BE 2.4.1 Release rounds "Solarize the Triangle" annually	High
BE 2.4.2 Designate a portion of the Community Climate Action Grant to incentivize participation in Solarize the Triangle for small businesses, nonprofits and farms	High
BE 2.5.1 Work with Planning Department to expedite permitting process for all new solar projects	Medium
BE 2.6.1 Establish a Working Group as part of the annual Ag Summit	High
BE 2.6.2 Utilize the seed funding for County's Cooperative Extension and Sustainability to launch this discussion	Medium
BE 3.1.1 Support energy efficiency programs and partners that provide energy efficiency services and education that serve historically-disadvantaged communities by providing services and education that reduce emissions, improve standards of living, support the local economy and workforce development	High
BE 3.1.2 Release rounds of the "Electrify the Triangle" program which would work to install EV chargers, induction ovens, electric heat pumps, etc in the community	High
BE 4.1.1 Launch the website by December 31, 2024.	Medium
BE 4.1.2 Compile a list of funding sources that local residents, businesses, or the County could potentially access to fund energy audits and energy efficiency improvements	Medium

[1] https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=1452268d-1905-4d1e-a5c8-a9e84351e53a

BUILT ENERGY AND ENVIRONMENT CONTINUED

Action Steps	Emissions Impact
BE 4.1.3 Develop and provide educational kits through the library and community groups to help with home energy audits and energy improvement education, summarizing information from the one-stop-shop website to create accessible resources.	Low
BE 4.2.1 Launch a sustainable business toolkit for businesses by 2026	Medium
BE 4.2.2 Develop an EV playbook for businesses/homes	Medium
BE 4.3.1 Staff tables at outreach events; Energy ambassadors staff informational tables at local events, engaging attendees with energy-saving tips and resources.	Low
BE 4.3.2 Host a community-wide event showcasing energy conservation, featuring workshops, exhibits, and expert speakers.	Low
BE 5.1.1 Follow LEED standards for two county facilities each year.	Medium
BE 5.2.1 Install geothermal heat pumps in county buildings	Medium
BE 5.3.1 Set up a Train-the-Trainer model that can be implemented County-wide	Low

GREEN COMMUNITY

Action Steps	Emissions Impact
GC 1.1.1 Focus on connectivity of open space	Medium
GC 1.1.2 Support the Department of Environment, Agriculture, Parks and Recreation to develop a resource that identifies those areas of the highest natural value that should be prioritized for preservation from new developments	Medium
GC 1.2.1 Transition landscaping at two County buildings per year beginning in 2027.	Low
GC 1.2.2 Install rainwater collection systems in two County buildings per year beginning in 2027.	Low
GC 1.2.3 Organize an event showcasing the County's green infrastructure.	Low
GC 2.1.1 Develop a Tree Master Plan by 2029	Medium
GC 2.1.2 Utilize “citizen scientist”residents to support tree inventory efforts	Low
GC 2.1.3 Organize a bi-annual tree giveaway program, native plant sale/seed giveaways. Maintain and make available list of local native plant growers	Low
GC 3.1.1 Launch two new initiatives or collaborations with local farms each year; prioritize carbon sequestration projects	Medium
GC 3.1.2 Direct the public to resources from research-based organizations such as Cooperative Extension and other land-grant institutional programs	Low
GC 4.1.1 Enhance branding of locally sourced food and focus on building a stronger ag tourism network	Medium
GC 4.1.2 Host gardening workshops utilizing community center gardens; promote staff/volunteer led gardens on County properties/parks that have space and especially in areas that may be considered food deserts	Low
GC 5.1.1 Define sustainable farming practices outlined in the U.S. Code Title 7, Section 3103	Low
GC 5.1.2 Provide a clearinghouse of information for farmers and funding opportunities available for implementation of sustainable farm practices through County Extension office	Low
GC 5.1.3 Target carbon sequestration and renewable energy projects for farmers practicing sustainable farming on County land	Low
GC 5.1.4 Promote the County's Community Garden Grant Program	Low
GC 6.1.1 Organize community workshops on the importance of native landscaping and pollinators.	Low
GC 6.1.2 Establish a recognition program for households and businesses that adopt native landscaping.	Low
GC 6.2.1 Organize a workshop on rainwater capture each year beginning in 2024	Low
GC 6.2.2 Distribute free rainwater capture kits at each workshop	Low
GC 6.2.3 Showcase rainwater capture infrastructure at the Davis Center and replicate at other park facilities	Low
GC 6.3.1 Establish partnerships with two new initiatives each year to improve protection of lands and streams beginning in 2030 through 2035	Low
GC 6.3.2 Develop educational resources on land and stream protection.	Low
GC 6.3.3 Implement a volunteer program for natural environment protection	Low
GC 6.4.1 Provide staff support for the implementation of the Chapel Hill-Carrboro Freight Train Trail Feasibility Study initiative	Low
GC 6.4.2 Ensure that public transit pick up/ drop off locations are located along these networks (Action T.1.1)	Low
GC 6.4.3 Promote the Train Trail initiative through the Parks and Recreation Department	Low
GC 6.5.1 Receive Board of Commissioner approval to expand the Community Climate Action Grant program	Medium
GC 6.6.1 Coordinate a swap out program for gas powered landscaping equipment with all electric	Medium
GC 6.6.2 Provide incentives for all electric landscaping equipment	Medium

RESILIENT COMMUNITY

Action steps	Emissions Impact
CR 1.1.1 Conduct annual reviews and updates of the FEMA Hazard Mitigation Plan	Low
CR 1.1.2 Organize quarterly meetings with stakeholders to assess the implementation of the Eno-Haw Regional Hazard Mitigation Plan	Low
CR 1.1.3 Produce an annual report on mitigation plan progress, seeking a 5% improvement each year beginning in 2030	Low
CR 1.1.4 Seek funding through FEMA hazard mitigation grants	Medium
CR 1.2.1 Develop a comprehensive communication plan for climate threats by 2026	Medium
CR 1.2.2 Partner with at least four community leaders, nonprofits and schools annually to disseminate the communication	Low
CR 1.2.3 Conduct monthly training sessions on the use of social media for climate threat communication	Low
CR 1.3.1 Develop and implement a program offering discounted electric-powered generators to at least eight lower-income residents per year beginning in 2032	Low
CR 1.3.2 Organize an annual information campaign about the electric-powered generator discount program	Low
CR 1.4.1 Identify potential public facilities that can serve as resilience hubs by 2030 and amend the Unified Development Ordinance to allow for these by right in certain zoning districts	Medium
CR 1.4.2 Prioritize the allocation of funding for preparation of these facilities	Low
CR 1.4.3 Organize resilience hub preparation and training sessions for facility staff	Low
CR 2.1.1 Develop a five-year plan to disincentivize the use of wet ponds	Low
CR 2.1.2 Partner with higher education resources within the County (UNC-CH, Durham Tech) to perform research and test pilot programs aimed at creating resilience with climate change. Plan for one research project per year beginning in 2027	Low
CR 2.2.1 Develop and implement comprehensive riparian ecosystem restoration plan and relevant floodplain management policies	Low
CR 2.2.2 Partner with Arts Commission to create murals using heat reflectant paint on County properties that do double duty as a resiliency measure but also to inform and educate the community about climate change and its impacts	Low
CR 2.2.3 Do a study to evaluate reducing unnecessary parking spaces to decrease impervious surfaces and create more green spaces.	Low
CR 2.2.4 Promote light-colored roofs and/or a minimum specified reflectance for commercial roofs when new or at replacement	Low
CR 2.2.5 Promote alternative cooling strategies like shade trees, green roofs, and building awnings. Determine and enact standards for new buildings (supportive of BE 1.2.2)	Low
CR 3.1.1 Organize annual public events to increase climate impact awareness	Low
CR 3.1.2 Establish partnerships with at least two schools or community organizations like Urban Sustainability Solutions who can support rain garden installations and green infrastructure education in the community	Low
CR 3.2.1 Provide climate resiliency information in newsletters geared for the business community	Low
CR 3.2.2 Organize bi-annual networking events focused on climate preparedness and resiliency	Low
CR 3.2.3 Promote the sustainable business toolkit	Low
CR 3.3.1 Utilize the Climate Action Tracker to record progress on the Triangle Regional Resilience Assessment planning document	Low

RESILIENT COMMUNITY CONTINUED

Action steps	Emissions Impact
CR 3.3.2 Identify areas most vulnerable to the effects of extreme heat; prioritize tree plantings in these areas.	Medium
CR 3.3.3 Monitor and report annually on the implementation of the Resilience Assessment recommendations.	Low
CR 4.1.1 Encourage the usage of reflective paint, installation of misters in outdoor spaces, and the planting of trees in areas that the heat island study identifies as needing relief from urban heat island effects	Medium
CR 4.2.1 Monitor and report annually on the progress of this conservation initiative	
CR 4.3.1 Implement permeable, GI alternatives to paving in sidewalks, parking lots and driveways	Low
CR 5.1.1 Use the Department of Social Services' registry to continue to access populations with special needs during the time of disasters	Medium
CR 5.1.2 Expand Community Emergency Response Team program that teaches community members real world disaster response skills to respond to community emergencies in the event that public safety is compromised	Medium
CR 5.1.3 Collaborate with community-based organizations to develop an inventory of locations with isolated seniors and develop a plan for a social support network during heat waves, bad air quality days, and other emergencies	Medium
CR 5.1.4 Expand the Steps to Neighborhood Preparedness Program that helps communities connect and build neighborhood emergency plans	Medium
CR 6.1.1 Ensure that maintenance reflects expected future climate conditions and variability and not historical climate data for all County buildings, facilities, structures, and infrastructure.	Low
CR 6.1.2 Establish an interdepartmental working group to integrate climate preparedness in planning, maintenance, and capital improvements through the development of work plans, screening of capital improvements, and cross-sector collaboration.	Medium
CR 6.1.3 Develop a "Green Team" whose purpose is to educate departments on implementing sustainable practices	Low
CR 6.2.1 Integrate annual CAP report goals during the budget review process at the direction of the Board of County Commissioners. Plan to inventory GHG emissions every two years and track against targets.	High
CR 6.3.1 Evaluate staffing levels needed to implement CAP strategies	High

ABAU: adjusted business-as-usual

BAU: business-as-usual

BOCC: Board of County Commissioners

Btu: British thermal unit

CAFE Standards: Corporate Average Fuel Economy Standards

CAP: Climate Action Plan

CCAG: Community Climate Action Grant Program

C&D: construction and demolition

CDC: Center for Disease Control

CFE: Commission for the Environment

CFI: Charging and fueling infrastructure

CH4: methane

CO2: carbon dioxide

CO2e: carbon dioxide equivalent

DCHC-MPO: Durham-Chapel Hill Metropolitan Planning Organization

DEAPR: Department of Environment, Agriculture, Parks, and Recreation

DEQ: Department of Environmental Quality

DERA: Diesel Emissions Reduction Act

DOT: Department of Transportation

DOE: Department of Energy

EIA: Energy Information Administration

EIE: Environmental Insights Explorer

EILP: Energy Improvement Loan Program

EO: Executive Order

EPA: Environmental Protection Agency

EPC: Energy Performance Contracts

ERA: Energy Improvements in Rural or Remote Areas

ESCO: Energy Service Company

EV: electric vehicle

EVSE: electric vehicle supply equipment

FEMA: Federal Emergency Management Agency

FTA: Federal Transit Administration

GAP Certification: Good Agricultural Practices Certification

GHG: greenhouse gas

GI: green infrastructure

GWP: global warming potential

HB: House Bill

HFCs: Hydrofluorocarbons

HGL: Hydrocarbon Gas Liquids

HOA: Homeowner Association

HVAC: heating, ventilation, & air conditioning

ICLEI: International Council for Local Environmental Initiatives

IPCC: Intergovernmental Panel on Climate Change

IRA: Inflation Reduction Act

ITC: Investment Tax Credit

kg N: kilograms of nitrogen

kW: kilowatt

kWh: kilowatt hours

LEED: Leadership in Energy and Environmental Design

LGO: local government operations

LIHEAP: Low Income Home Energy Assistance Program

LMI: low-to-moderate income

LPG: Liquid Petroleum Gas

MMBtu: one million British thermal units

MSW: municipal solid waste

MTCO2e: metric tons carbon dioxide equivalent

MW: megawatt

MWH: megawatt hours

NC: North Carolina

N2O: Nitrous oxide

OC: Orange County

OCCO: Orange County Commuter Options

OWASA: Orange Water and Sewer Authority

PACE: Property Assessed Clean Energy

PFCs: Perfluorocarbons

PIO: Public Information Office

PORCH Hillsborough:

PPP: public-private partnerships

PTA: Parent-Teacher Association

PTC: Production Tax Credit

RAISE: Rebuilding American Infrastructure with Sustainability and Equity

RECs: Renewable Energy Certificates

RFP: request for proposals

RSPC: Renewable Energy Special Projects Committee

SF6: Sulfur hexafluoride

SFC: specific fuel consumption

SRVC: SERC Virginia/Carolina

TDM: transportation demand management

UNC: University of North Carolina

USDA: United States Department of Agriculture

USI: Utility Savings Initiative

VMT: vehicle miles traveled

WAP: Weatherization Assistance Program